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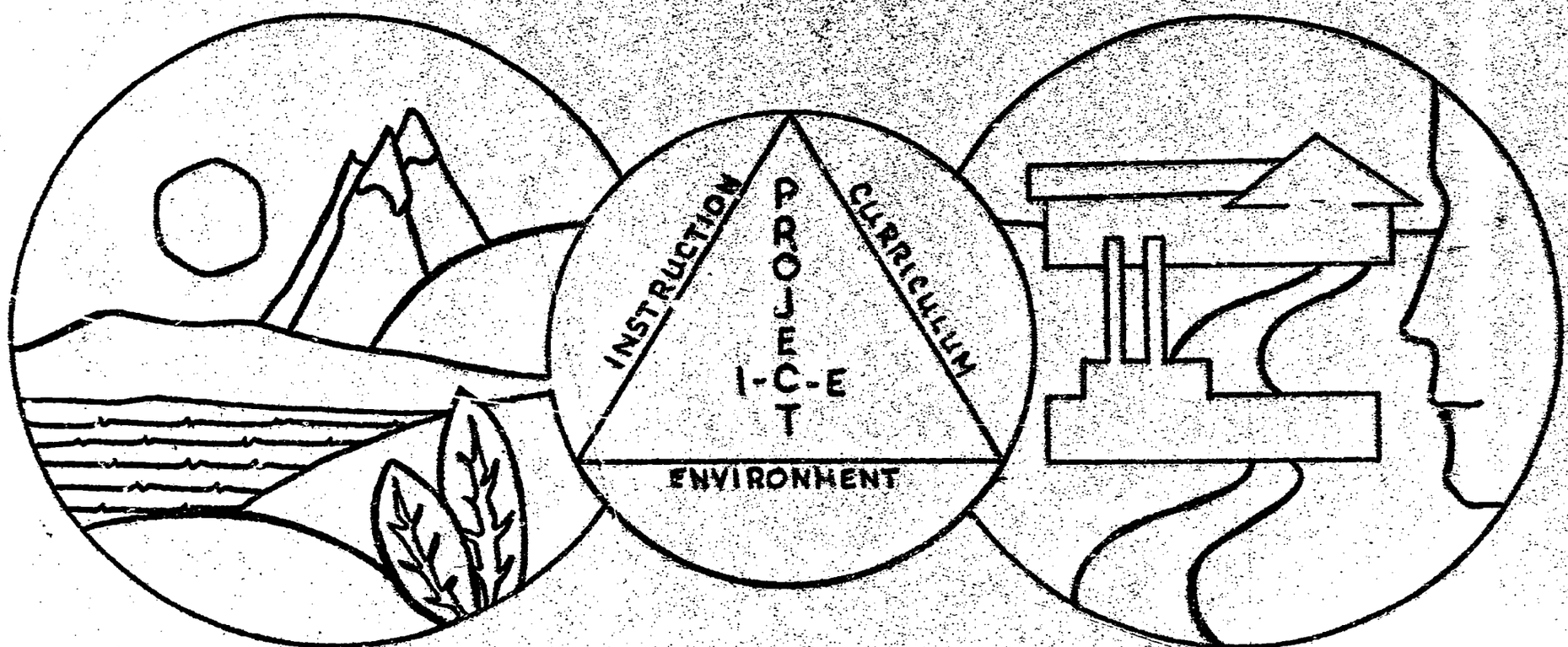
ABSTRACT

This sixth grade environmental education guide is one of a series of guides, K-12, which were developed by teachers to help introduce environmental education into the total curriculum. The guides are supplementary in design; it is the teacher's decision when the concepts, objectives, activities, and resources may best be integrated into the existing classroom curriculum. This guide contains a series of episodes (minilessons), each having a number of suggested in- and out-of-class learning activities. The episodes are built around 12 major environmental concepts that form a framework for each grade or subject area, as well as for the entire K-12 program. Although the same concepts are used throughout the K-12 program, emphasis is placed on different aspects of each concept at different grade levels or in different subject areas. This guide focuses on aspects such as energy, air-graphing, natural resources, and a political convention turned environmental. Each of the 12 concepts is covered in one of the episodes contained in the guide. Further, each episode offers subject area integration, subject area activities, interdisciplinary activities, cognitive and affective behavioral objectives, and suggested references and resource materials useful to teachers and students. An appendix containing related games is included. (Author/TK)

ENVIRONMENTAL EDUCATION GUIDE



GRADE SIX

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FORWARD TO PROJECT I-C-E ENVIRONMENTAL EDUCATION GUIDES

In 1969, the First Environmental Quality Education Act was proposed in the United States Congress. At the time of the introduction of that legislation, I stated:

"There is a dire need to improve the understanding by Americans of the ominous deterioration of the Nation's environment and the increasing threat of irreversible ecological catastrophe. We must all become stewards for the preservation of life on our resource-deficient planet."

In the three years since the Environmental Education Act was passed by the Congress, much has happened in the United States to reinforce the great need for effective environmental education for the Nation's young people. The intensive concern over adequate energy resources, the continuing degradation of our air and water, and the discussion over the economic costs of the war against pollution have all brought the question of the environmental quality of this nation to a concern not merely of aesthetics but of the survival of the human race.

The intense interest by the public in the quality of our lives as affected by the environment clearly indicates that we cannot just use incentives and prescriptions to industry and other sources of pollution. That is necessary, but not sufficient." The race between education and catastrophe can be won by education if we marshall our resources in a systematic manner and squarely confront the long-term approach to saving our environment through the process of education.

As the incessant conqueror of nature, we must reexamine our place and role. Our world is no longer an endless frontier. We constantly are feeling the backlash from many of our ill-conceived efforts to achieve progress.

Rachel Carson's theme of "reverence for life" is becoming less mystical and of more substance as our eyes are opened to much of the havoc we have wrought under the guise of progress. A strong commitment to an all-embracing program of environmental education will help us to find that new working definition of progress that is a pre-requisite to the continued presence of life on this planet.

- Senator Gaylord Nelson

PREFACE

Why Environmental Education for Grade Six

We, as educators, are preparing students to enter a society where awareness of environment is becoming increasingly important. At this level students are capable of becoming aware of their environmental surroundings and their responsibility to the same. Man must relate as part of the ecosystem rather than an observer apart from it. If students appreciate the world in which they live and realize their responsibility to preserve its resources there is hope for future generations. What we do today to a great extent will shape the environment of tomorrow.

Environmental education can be defined as the use of the environment to expand the lessons of the classroom. The episodes in this guide seek to do this. The suggestions provide variety and student involvement. For example, Concept #9 covers such diversified activities as investigating the effects of the introduction of salt to a particular environment, the class involvement in a land management game to study the impact man has on his environment as well as proper management, and concludes with the role playing of various societies ranging from have to have nots. These activities can be incorporated into structural as well as self-contained science, social studies and drama classes.

The episodes in this booklet do not have to be an entity in themselves. Separate activities in part or in whole as well as numerous variations can be integrated into the current curriculum.

Through the use of these episodes it is hoped that the students will develop the environmental awareness that is so necessary today, that they will see themselves in relation to their surroundings and formulate values for the future.

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DIRECTIONS FOR USING THIS GUIDE

This guide contains a series of episodes (mini-lesson plans), each containing a number of suggested in and out of class learning activities. The episodes are built around 12 major environmental concepts that form a framework for each grade or subject area, as well as for the entire K-12 program. Further, each episode offers subject area integration, multi-disciplinary activities, where applicable, both cognitive and affective behavioral objectives and suggested reference and resource materials useful to the teacher and students.

1. This I-C-E guide is supplementary in design--it is not a complete course of study, nor is its arrangement sequential. You can teach environmentally within the context of your course of study or units by integrating the many ideas and activities suggested.

2. The suggested learning activities are departures from regular text or curriculum programs, while providing for skill development.

3. You decide when any concepts, objectives, activities and resources can conveniently be included in your unit.

4. All episodes can be adapted, modified, or expanded thereby providing great flexibility for any teaching situation.

5. While each grade level or subject area has its own topic or unit emphasis, inter-grade coordination or subject area articulation to avoid duplication and overlap is highly recommended for any school or district seeking effective implementation.

This total K-12 environmental education series is the product of 235 classroom teachers from Northeastern Wisconsin. They created, used, revised and edited these guides over a period of four years. To this first step in the 1,000 mile journey of human survival, we invite you to take the second step--by using this guide and by adding your own inspirations along the way.

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PROJECT I-C-E TWELVE MAJOR ENVIRONMENTAL CONCEPTS

1. The sun is the basic source of energy on earth. Transformation of sun energy to other energy forms (often begun by plant photosynthesis) provides food, fuel and power for life systems and machines.

2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.

3. Environmental factors are limiting on the numbers of organisms living within their influence. Thus, each ecosystem has a carrying capacity.

4. An adequate supply of clean water is essential to life.

5. An adequate supply of clean air is essential for life.

6. The distribution of natural resources and the interaction of physical environmental factors greatly affect the quality of life.

7. Factors such as facilitating transportation, economic conditions, population growth and increased leisure time influence changes in land use and population densities.

8. Cultural, economic, social, and political factors determine man's values and attitudes toward his environment.

9. Man has the ability to manage, manipulate and change his environment.

10. Short-term economic gains may produce long-term environmental losses.

11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.

12. Each person must exercise stewardship of the earth for the benefit of mankind.

A "Concept Rationale" booklet and a slide/tape program "Man Needs His Environment" are available from the I-C-E RMC to more fully explain these concepts.

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E. S. E. A. Title III -- PROJECT I-C-E 59-70-0135-4

Environmental:

Integrated with: Science, Math, Language Arts

CONCEPT NO. 1 - Energy

SUBJECT

ORIENTATION Sun's Energy

TOPIC/UNIT Energy

BEHAVIORAL OBJECTIVES

Cognitive:

Give new examples that indicate that life is dependent upon energy from the sun and that this energy can be transferred from one form to another.

Affective:

Continue to find examples in nature that indicate ways in which life is dependent upon the sun and that the energy from the sun runs the eco-system.

Skills Used:

1. Experimentation
2. Observation
3. Recording
4. Graphing
5. Charting information
6. Writing reports
7. Concluding

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

I. Science and Math
   A. Experiment showing importance of sun's energy for living things.
      1. In student groups prepare four test tubes.
         a. Two, each with water, a snail, and a piece of water plant. These are sealed so that no air can get in.
         b. Two, each with water, a snail, and a piece of water plant. These two are not stoppered, but left open to the air.
         c. One each of the stoppered and open test tubes will be covered so they have no access to light. The other stoppered and open tubes will be placed where they will receive light in a normal way.

(Continued)

Outside or Community:

I. Science
   A. Take students to a nearby lake, pond or stream to observe evidence of the same thing on a larger scale.
   B. Field trip to a wooded area to observe:
      1. What happens to most of the leaves that fall to the ground.
      2. How mushrooms or other non-green plants draw the sun's energy from green plants which contain sugar.
   C. Field trip to a power plant or generating station to observe how sun's energy stored in fossil fuels is put to use to produce electricity.

SUGGESTED RESOURCES

Publications:

Any text etc. that deals with photosynthesis, ex.-Life - Its Forms and Changes, Harcourt, Brace and Jovanovich

I.I.S. Series Biology Idea 5: Ecology, Wong & Dalmatz, 1971, Prentice Hall, Inc.

"Energy", Joseph J. Schwab, Biology Teacher's Handbook, John Wiley and Sons, Inc., New York, 1963

Audio-Visual:

Films:
Riddle of Photosynthesis, U.S. Atomic Energy Commission, Argonne, Illinois
Micro-organisms: Beneficial Activities, BAVI
Photosynthesis
filmstrips
transparencies
charts

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

2. Each day the four test tubes will be placed side by side for a short time to allow students to observe and record, draw or graph any changes.
3. It will be shown that light (sun) is required for life.
   a. Lack of oxygen in the sealed, dark tube killed the snail.
   b. Food supply was exhausted in the dark tube that was sealed.
4. The metric system could be used to do the measuring.

B. Experiment showing energy transfer.

1. Prepare a sample of soil water; weigh out one gram of soil and combine it with one liter of water.
2. Prepare two test tubes, each half filled with water, one ml of soil water and a 6-inch strip of paper. Stopper each tube with a cotton plug. Sterilize one tube.
3. Place both tubes together in a warm place for 1-2 weeks. After 10-14 days make two observations.
   a. Look at the paper at the surface noting any color change.
   b. Hold the tube in one hand and gently slap the bottom of the tube with the other hand. Does the paper break? If the paper does not break gently, pull it with your forceps. Does the paper break now? What is present in the tube in which the paper breaks?

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	CLASSROOM (Continued) 4. It will be shown that energy from the sun is stored in the paper in the form of sugar or hydrocarbons and becomes the food energy for organisms (bacteria of decay) contained in the soil. Lack of organisms in control prevented transfer of energy from the paper. II. Language Arts A. Following experiments, students should write a report on the results and conclusions. B. Write essay on "The Importance of the Sun In Our Lives".
Audio-Visual:	
Community:	

E. S. E. A. Title III — PROJECT I-C-E 59-70-0135-4

Environmental: **Integrated with:**

CONCEPT NO. 1 - Energy SUBJECT Art

ORIENTATION Sun Energy TOPIC/UNIT Shade and Shadow

BEHAVIORAL OBJECTIVES

Cognitive:

Predict consequences of sun shining on given objects for a long period of time.

Affective:

Investigate a number of situations that indicate the effect of continued sunshine on an object and make conclusions or generalizations:

a. Amount of shadow.
b. Color of surface.
c. Texture of surface.
d. Length of time in sun.

Skills Used:

1. Drawing
   a. Pencil
   b. Charcoal
   c. Oil pastels
   d. Crayon
2. Appreciation
   a. Art history
3. Visual awareness

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

A. The sun gives us light.
   1. Try to capture the effect of light on an object. May use charcoal.
   2. Study Rembrandt and how he captured light.
   3. Shade and Shadow - gradation of white → gray → black.

Outside or Community:

A. Students should find a picture that shows sunlight on an object.
B. Field trip to school neighborhood on sunny day. Awareness of shade and shadow.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: "Drawing With Mixed Media", M. B. Bowman, School Arts, 71:14-15, N '71 **Audio-Visual:** Film: Sunlight and Shadow in Paintings, BAVI **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 1 - Energy

SUBJECT Art

ORIENTATION Sun Energy

TOPIC/UNIT Collage

BEHAVIORAL OBJECTIVES

Cognitive:

Create a representation of the sun using illustrations of sun designs in a collage form.

Affective:

Demonstrate aesthetic awareness by using sun-based designs in his art project or collage.

Skills Used:

1. Drawing
2. Collage techniques
3. Knowledge of symbols

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Motivational activity.
   1. Play "Let The Sun Shine In" and "Aquarius" from the album Hair.
   2. Using sun and zodiac symbols, do a collage of all ideas that come into the student's head about the sun when the song is being played.
      a. Drawings, magazine pictures, paint and textured materials may be used. Stress use of warm colors.

Outside or Community:

A. Collect pictures and materials for collage.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

"Aspects of Collage", W. Farnsworth, Arts & Activities, p. 36-39, Feb. '72

"Shattered Shapes", A. Guga, Arts & Activities, 71:22-4, Ap. '72

"Oops...It's Op" (Collage), L.De Wyngaert, School Arts, 71:8 Ap. '72

"Kelly Collage and Color", D. Waldman, bibliography, Art News, 70:44-7, D '71

"Mixed Media Collage", J. Comins, School Arts, 71:10-11, N. '71

Audio-Visual:

Albums:

Hair

The Sun Symbol in Art, Bailey Films, California

Community:

Environmental: **Integrated with:**

CONCEPT NO. 2 - Ecosystem SUBJECT Social Studies, Language Arts

ORIENTATION Interrelationships TOPIC/UNIT Ecosystems

E. S. E. A. Title III - PROJECT I-C-E 59-70-0135-4

BEHAVIORAL OBJECTIVES

Cognitive.

Describe the interrelations of the ecosystem in writing with illustrations that are appropriate to the written description.

Affective:

Support the proposition that there are interactions of living organisms in the ecosystem, with examples.

Skills Used:

1. Observing
2. Discussing
3. Comparing
4. Writing reports
5. Defending ideas

STUDENT-CENTERED LEARNING ACTIVITIES

In Class:

I. Social Studies
- A. Show and discuss movie "Conservation and Balance of Nature" from BAVI or another appropriate film.
  1. What is man doing to his environment?
  2. How do organisms interrelate in food webs?
  3. Why is variety important to a natural community's balance?
  4. What causes a community to be balanced?
  5. What causes a disruption in the balance of a community?
- B. Comparative discussion of the ecosystem in movie with that on a farm.

II. Language Arts
- A. Each student may write their understanding of an

(Continued)

Outside or Community:

I. Social Studies
- A. Class visit a farm that is diversified with farm animals, fowl, crops, woodlot and a stream.

II. Language Arts
- A. Take the class outside (school yard, park, etc.) to observe ecosystems. Instruct each student to collect three items which they will later use in class to orally explain the interdependence and interaction within an ecosystem.
- B. For an extended field trip, use ICE field guide activity "Ecology Treasure Hunt #1". Complete lesson attached.

SUGGESTED RESOURCES

Publications:

The Web of Life by John H. Storer Pub. Signet Key Bk, New American Library of World Literature, New York

Little Wonder Book Series, "Balance in Nature - Our Land of Plenty", Charles E. Merrill, Columbus, Ohio

Ecology Treasure Hunt #1, available at ICE RMC

Audio-Visual:

Films:

Balance in Nature, BAVI

One Day At Teton Marsh, Walt Disney, ICE RMC, Film #200

Community:

A farm that will illustrate the value of the balance of nature

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

ecosystem with a diagram or illustration, showing interdependence.

B. Play ecosystem game. Each child chooses to play the part of something in an ecosystem. (Example: forest ecosystem). Hand a ball of string to one child. He explains what he is. (Example: a tree). Then unwind the string to reach another student who is something that the tree depends upon (Example: soil). Continue until all children are included and an extensive web is created. Each child must explain why or how the previous person needs him.

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ECOLOGY TREASURE HUNTS

field experiences for grade school students based on:

Concept #2 All living systems interact among themselves and their environment forming an intricate unit called an ecosystem.

A first principle of ecology is that "everything is connected to everything else". Every living thing in a natural area is competing to grow and maintain itself. At the same time each living thing needs something from other living things. It also gives something to other living things.

The plants give energy in the form of food--they give oxygen, they get carbon dioxide and fertilizers from animals. Small plants get shade. Large plants provide the shade but get protection of the soil from erosion.

Some animals use food from the plants. Other animals eat the plant eaters. They keep populations in control.

Bacteria and mushrooms eat up dead plants and animal wastes to recycle nature's leftovers. So do many small animals in the soil. The large plants get good soil conditions because of these animals.

If you would think about it, you could think of many ways plants and animals help each other. The best way is to go to where nature works. Take a walk or field trip to any wild spot. Look around. Poke around in the soil and in the old logs and things on the ground.

To help you learn how everything in nature is connected together, go on an ecology treasure hunt.

TREASURE HUNT #1

Growing Season
Grades 4-6

What to do: Find the parts of nature's interconnected puzzle. Use the clues given below.

Take small samples of some of these to show to your classmates. Be careful not to take a lot of stuff because nature needs its parts. Don't wreck the ecosystem by being greedy. Write down the answers on questions which don't ask you to bring something back.

What do you need: Several small plastic bags. One medium size paper or plastic bag. Some small tags. Two small baby food size jars. A pencil. A trowel would be handy.

Where to go: Any wild place which isn't used by man very often. Get permission of the land owner.

Treasure Hunt Clues

Find as many of these as you can in the time you have to work. Think carefully about each clue. Find the parts of nature's puzzle. What makes nature operate? Check off the clue when you find an answer. Use only one clue for each thing.

Bring Backs

_____ A small thing waiting to grow into something bigger.

_____ An animal which recycles nature's waste.

_____ The smallest bit of life that makes food from sunlight energy.

_____ A small animal with 4 wings.

_____ A plant (part) which hitches a ride.

_____ An animal eaten (when it is caught) by another animal.

_____ Two plants which live together.

_____ A color which captures sun energy.

_____ A hiding place for a small animal.

_____ An animal which lives in dark places.

_____ A plant which does not make its own food.

_____ Some animal with 6 legs.

_____ A twig with opposite branches.

_____ An animal which eats plants.

_____ An animal which crawls but will change to one that flies.

_____ A small plant that floats on the water in a puddle or small pond.

Write Abouts

The home of a large animal _____

A flying animal that sings _____

A place where animals raise their babies _____

A sign left by a large animal which tells who he is _____

The biggest living thing in your study area _____

The protective coating of a large plant _____

(tell its color and how it looks) _____

A liquid which is important for life _____

The thing which gives energy to all the life in your area _____

A group of living things which are all very much alike _____

Two things which are very different and why _____

_____

Why? _____

In The Classroom

Compare the different bring backs and write abouts. Discuss why these show the interconnection of nature. Go to the resource center to find more about the things you found and how they help keep nature working. Write a report about your favorite thing you found or prepare a talk to tell about it. Remember to include how it is connected to the rest of nature.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 2 - Ecosystem

SUBJECT Physical Education

ORIENTATION Interaction

TOPIC/UNIT Team Sports

BEHAVIORAL OBJECTIVES

Cognitive:

Verbally explain the cause-effect interdependence of an ecosystem.

Evaluate the use of the cause-effect interaction that takes place in a game as being an analogy to that of an ecosystem and give his reason(s).

Affective:

Demonstrate awareness of the interaction and interdependence in the environment around them by identifying new examples in his immediate area (home to school, park, etc.).

Skills Used:

1. Skill related to specific game.
2. Observation (knowledge).
3. Application.
4. Analysis.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Choose a game depending on season: soccer, kickball, volleyball, softball.
   1. Have the students play a game.
   2. Score should be kept.

B. Discussion: Student-centered, teacher-directed.
   1. Why did one team win and one team lose? Better team. Comment: Work together more.
   2. Assuming class understands the interaction of players in the game, name other types of ecosystems. How are the organisms dependent on each other? School, classroom, home, family, community are examples.

Outside or Community:

A. Classroom correlation activities.
   1. Have a coach or athlete discuss the question "How is the team like an ecosystem?"

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Dynamic Physical Education for Elementary School Children	
Audio—Visual:	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 2 - Ecosystem **SUBJECT** Language Arts

ORIENTATION Ecosystem Interrelationships **TOPIC/UNIT** Reference Use and Critical Reading

BEHAVIORAL OBJECTIVES

Cognitive:

List five different examples from outside reading sources in which animals interact among themselves to provide a balance in nature.

Affective:

Use critical reading and reference skills to further investigate the amount and types of interaction of animals needed to maintain an intricate unit called an ecosystem in sources not assigned in class.

Skills Used:

1. Research skills - using more than reference.
2. Writing reports.

STUDENT--CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss how animals depend on each other for a food source.

B. Select an animal to investigate (what it eats and what it is a prey of).

C. Group discussion of article referring to the deer population on the Kaibab Plateau. Article can be found in most ecology and population books.

D. Use reference material within room to investigate food chain.

E. Compare what was discovered on field trip to findings from library work. Discuss similarities and differences.

F. Write reports on the types of animals that are prey to particular animals and what animals are its predators.

G. Students make simple food chain illustrations and emphasize man's dependency upon a well-balanced ecosystem.

Outside or Community:

A. Library
   1. Go to reference material to check food chain of animals.

B. Community
   1. Visit a zoo, farm, fish hatchery and have guided tour. Discuss the food chain of animals found in area.

C. Have a game warden visit the classroom and discuss the intricate food chains necessary to maintain life. Explain why people are allowed to hunt animals such as deer. Discuss what would happen if deer were not killed off by hunters.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Encyclopedia Card catalog Magazines Biology, Cockram, McCandy, Youngram, W. B. Saunders Company, 1966 **Audio–Visual:** Filmstrips: Communities of Living Things, McGraw-Hill, ICE RMC, FS St 6 Interdependence of Living Things Series, McGraw-Hill, ICE RMC, FS St 13 Kit: Animal and Plant Communities, McGraw-Hill Study Prints, ICE RMC, KT 37 **Community:** State Historical Society Wildlife Federation DNR	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 2 - Ecosystem

SUBJECT Art

ORIENTATION Interdependence within a Community

TOPIC/UNIT Mobiles

BEHAVIORAL OBJECTIVES

Cognitive:

Arrange in order of sequence, from least dependent to most dependent, a listing of animals and their needs and the sources of food and shelter.

Affective:

Choose objects for use in his mobiles which indicate the interdependency of nature.

Choose the use of a mobile as a sculptural medium, when given the choice, to illustrate the interdependency of things in nature.

Skills Used:

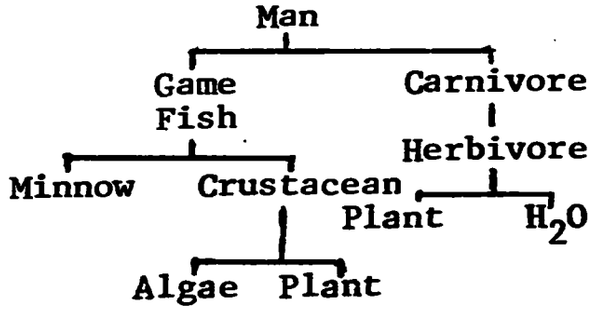
1. Ability to cut out, paint or otherwise decorate the parts, coordinate these in creating a pleasing and meaningful design.
2. Ability to suspend and balance multiple objects.

(Continued)

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Mobile construction.
   1. Use symbols of the ecosystem in the numerous parts being suspended...the student may elect to incorporate more than one eco-symbol in his design or limit his design to using variations of just one eco-symbol. Examples:
      a. (Use symbols or pictures.)



(Continued)

Outside or Community:

A. Travel to see a building or room having mobiles suspended in it.
B. View a museum display (Milwaukee Museum) to familiarize themselves with the ecosystem chains before constructing their mobiles.
C. Use the finished mobiles to decorate a community building (hospital, bank, store, library, gallery, etc.).

SUGGESTED RESOURCES

Publications:

"Balance on a Shoestring", O.C. Locke, Arts & Activities, p. 14-16, June '70

"Skylight Mobiles", W.D. Ehlers, Arts & Activities, p. 20-1, Jan. '71

"Papercrafts and Mobiles", R. Perlmutter, Teaching Exceptional Children, p. 134-41, Spring '72

"Why Don't You Make a Mobile", M. Shaw, Arts & Activities, p. 32-3, April '72

Audio-Visual:

Slides and books on work of Alexander Calder.

Filmstrip:
Ecology - Our Challenge, ICE RMC, FS St 17

Community:

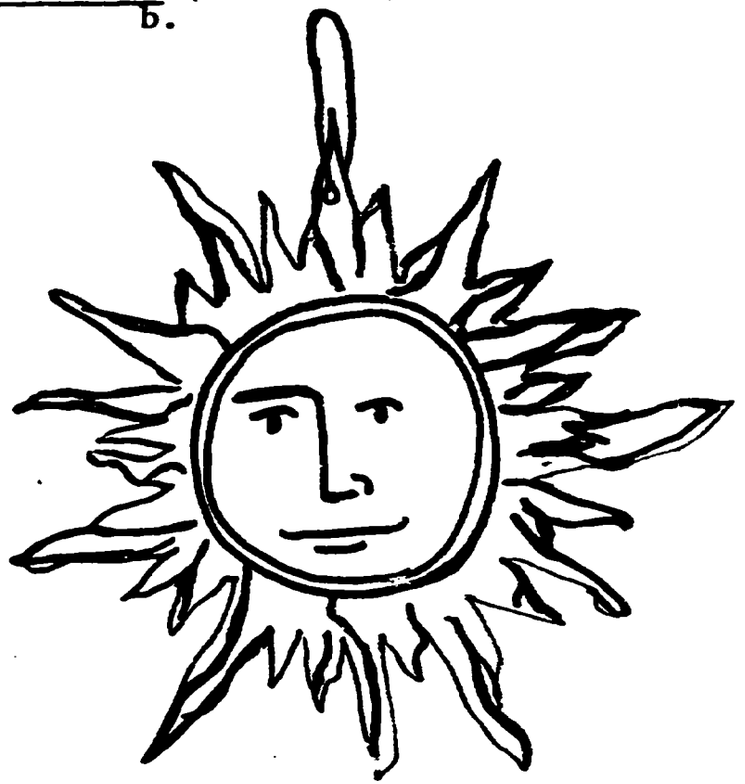
CONTINUED OR ADDED LEARNING ACTIVITIES

SKILLS (Continued)

3. Attaching supports and threads to the individual pieces.
4. Threading a needle (if a needle is used to put the thread through the shapes.)

CLASSROOM (Continued)

b.



3. Study Alexander Calder's mobiles.

Environmental: **Integrated with:**

CONCEPT NO. 2 - Ecosystem **SUBJECT** Science (Math)

ORIENTATION Ecosystems **TOPIC/UNIT** Plants

BEHAVIORAL OBJECTIVES

Cognitive:

Demonstrate a population of grass, clover and/or other plants in combination in a terrarium which allows him to make observations and measurements of:

a. Growth rates of plants.
b. Amount of water added to terrarium.

Construct a bar graph of data collected in a measurement of growth study using growth, time.

Affective:

Defend the assumption that all living organisms interact among themselves for survival, using the results gained in the terrarium study as support data.

Skills Used:

1. Arrange materials, plant & water seeds. Care for all materials.
2. Develop ways of studying plants, their rate of growth, manner of growth, effects on each other.

(Continued)

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Initiative should be stressed in that each two students will establish terrarium using various types of containers. (Gallon jars work well--even 2-quart jars will do. Grass and clover seeds should be supplied to the students. In addition to these, other types of seeds may also be used. Suggest use of different types of soils and soils taken at different depths.
B. Establish with class:
   1. Care of terrarium, watering, etc.
   2. Observation of terrarium, sharing observations.
   3. Identifying plants as they sprout and develop--parts of plants.
   4. Measure & record growth of a plant over regular intervals of time. Use metric measure if possible.

(Continued)

Outside or Community:

A. Various ways of setting up terrariums can be found in references.
B. Students can be encouraged to start their own terrariums at home and use their imaginations and ingenuity in trying different things.
   1. Vary types of plants to grow and observe.
   2. Using same types of seeds and several small terrariums, vary numbers of seeds in each and observe their growth.
C. Library
   1. Locate information about the major soil groups in your area. Samples could be brought in.
D. Immediate area-nature hike.
   1. Observe abundance and variety of vegetation in different soils.

(Continued)

SUGGESTED RESOURCES

Publications:

People and Their Environment: Teacher's Curriculum Guide to Conservation Education, Matthew J. Brennan
Seed catalogs
Leaflet on establishing terrariums from National Audubon Society

Audio-Visual:

Films:
Seed Sprouting, Walt Disney Education Materials Co.
A Slice of Bread, Sterling Educational Films, ICE RMC, Film #330

Community:

Farm
Florist
DNR
Library
School forest or outdoor center

CONTINUED OR ADDED LEARNING ACTIVITIES

SKILLS (Continued)

3. Observation
4. Measuring
5. Classification
6. Recording
7. Graphing
8. Concluding

CLASSROOM (Continued)

5. Graph the recorded results of the plant growth with either bar, line or pictographs.

OUTSIDE ACTIVITIES (Continued)

E. Field trip to a farm.
   1. Interview the farmer.
      a. What kind of soil.
      b. What types of plants.
F. Field trip to a florist.
   1. Observe plants grown under controlled conditions.
   2. Why do certain plants grow in certain soils?

Environmental:

Integrated with:

CONCEPT NO. 3 - Carrying Capacity

SUBJECT Social Studies, Science, Math, Language Arts

ORIENTATION Carrying Capacity

TOPIC/UNIT Ecosystems

BEHAVIORAL OBJECTIVES

Cognitive:

Evaluate the position that a given environment can support only a limited number of organisms and state his reasons.

Demonstrate an experiment that will support the argument that a given environment can support only a limited number of organisms.

Affective:

Suggest that each individual has a certain space requirement for quality living.

Argue that man must limit his use of the natural environment if part of it is to remain for the benefit of future generations.

Skills Used:

1. Map reading.
2. Small group discussion and study.
3. Research.
4. Listening to and asking questions of the resource person. (Continued)

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

I. Social Studies
   - A. Motivational discussion to point out areas of overpopulation on the world map--study population map.
   - B. Divide class into groups, have each group discuss problems of overcrowding in various areas. (Ex.-classroom, school environment, community, state, nation.)
   - C. Appoint committees to study the following:
     1. Reasons for colonization.
     2. Given an overpopulated area:
        a. Why people settled there.
        b. Why it grew.
        c. Effects of overpopulation here.
     3. With help from an atlas, color the overpopulated areas of the world on an outline map. (Continued)

Outside or Community:

A. Have City Planner come to talk to the class about the planning of his city and the problems of an overpopulated city. Have class ask questions that are prepared and approved by the teacher.

B. Have a conservationist come in and talk about deer, bird and animal populations according to the carrying capacity of the land.

SUGGESTED RESOURCES

Publications:

The Population Bomb, Paul Ehrlich, Ballantine Books, 1968
Our Spaceship Earth, Morris Wall, Congressmen Report, VD. 8, #7, 1969
Overpopulation: How Many Are Too Many? Vivian Sorvall, Academic Paperbacks
Challenge of the Land, Charles E. Little, Oxford U., New York
Stewardship, The Land, The Land Owner, The Metropolis, N. Y. Open Space Inst., Inc., 1968

Audio-Visual:

Films:
Family Planning, Walt Disney,. ICE RMC, Film #230
More, MacMillan Films, Inc., ICE RMC, Film #530
The Green City, Stuart Finley, Inc., ICE RMC, Film #440

Filmstrip:
Interdependence of Living Things, McGraw-Hill, ICE RMC, FS St 13

Community:

City planning official
Police Department public relations representative
Library
Lake
DNR office
Sportsman's Club representative
Game Management Division representative

CONTINUED OR ADDED LEARNING ACTIVITIES

SKILLS (Continued)

5. Experimentation.
6. Observation.
7. Recording information.
8. Graphing.
9. Drawing conclusions.
10. Writing a questionnaire.
11. Interviewing.
12. Evaluating survey.

CLASSROOM (Continued)

II. Science and Math
  A. Guppy study.
    1. Set up 10-gallon aquarium system equipment with average filtration and aeration systems.
    2. Determine daily supply of maximum amount of fish food for twenty guppies to survive.
    3. Put ten male guppies and 10 females in tank.
    4. When second generation of fish appears, watch for disturbance of the balance of food compared to carrying capacity of the fish to survive.
    5. Record each day the number of fish present in tank and the number of offspring. Record, if possible, the gender of the fish present.
    6. Graph time vs. the number of fish present.
    7. Conclude the carrying capacity of the tank.

III. Language Arts
  A. Survey on party permits.
    1. Discuss the issues whether a party permit for hunting deer should be allowed in the state of Wisconsin.
    2. Pupils prepare a questionnaire that could be answered with yes or no about the issue.
    3. Each student should take one or more questionnaires to different people in their home and community.
    4. Students will tabulate the results of the questionnaire.
    5. Each student will write his own evaluation of the survey.

Environmental: Integrated with:

CONCEPT NO. 3 - Carrying Capacity SUBJECT Art

ORIENTATION Overpopulation TOPIC/UNIT Sculpture

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

BEHAVIORAL OBJECTIVES

Cognitive:

Define space relationships.

Create and construct an object or game that will demonstrate the relationship of space and the individual's use of available space.

Affective:

Weigh the use of alternative ways to demonstrate space relationships.
a. Sculpture
b. Games

Employ experimental measures to gain a more pleasing space relationship through a sculpture.

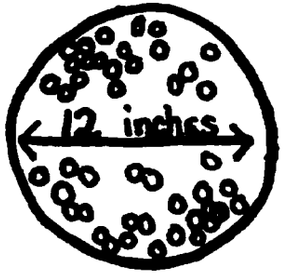
Skills Used:

1. Principles of sculpture.
2. Principles of space relationship.
3. Discussion.
4. Construction.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss space relationship.
When there is a very small space and many things on that space, what happens to the space? Or, what happens to the objects in space?
Example:



A circle 1' in diameter containing 150 marbles.

What happens when there is a very large space and few things to inhabit it?
1. Have students make a toothpick or pastestick sculpture.
2. Give each student a bundle of sticks

(Continued)

Outside or Community:

A. Have an architect come to talk to the class and explain space relationship.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: "Children's Sculpture", J. W. Burgner; School Arts, '71, Oct. p. 42-4 Fine Arts Publication, "Space", ICE RMC, FA 103 **Audio-Visual:** Film: Boomsville, ICE RMC, Film #400 **Community:**	CLASSROOM (Continued) held together by a rubber band to represent over-population. 3. Expand this bundle to a sculpture to divide space more equally. Stress positive and negative space.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 3 - Carrying Capacity

SUBJECT Art

ORIENTATION Relation Between The Whole And Its Parts

TOPIC/UNIT Composition

BEHAVIORAL OBJECTIVES

Cognitive:

Interpret data relative to carrying capacity.

Differentiate between printings of scenes that have balanced composition and those that do not.

Paint or draw a landscape or still life picture that has balanced composition.

Affective:

Demonstrate awareness of principles of composition by identifying the use of one or more in painting.

Skills Used:

1. Discussion.
2. Landscape drawing.
3. Still life.
4. Appreciation - art history.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss composition and relate to familiar things in our environment.
   1. Look out the school window (as a frame.) What do you see in this picture, or what is its composition?
   2. Give an example of balanced and unbalanced composition using trees.
   3. Student examples of drawings collected from magazines, etc. to illustrate composition.
      a. Landscapes.
      b. Still life.
   4. Teacher and student relate principles of composition in art to environmental factors in nature.
   5. Study landscape artists such as Cezanne and Andrew Wyeth.
   6. Draw a landscape or still life.

Outside or Community:

A. Have students do outside research on landscape and still life artists. (Wyeth, Russel, Remington, etc.)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: "Magic Cardboard Window", frames help children see pictures before they draw, S.M. Larue, il. Arts & Activities, 64:19-20 S '68 "Composition", Fine Arts Publication, ICE RMC, FA 104 **Audio-Visual:** Films: Marc Chagall, public library Discovering Composition in Art, BAVI **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 4 - Water **SUBJECT** Mathematics

ORIENTATION Water **TOPIC/UNIT** Recording, Problem Solving, Measurement

BEHAVIORAL OBJECTIVES

Cognitive:

Calculate the amount of water used and wasted within the school, community, state and nation in a day using data available from census bureau and school and average of class data from experiment in class.

Affective:

Offer suggestions of ways in which water can be conserved in:

a. School.
b. Home.

Skills Used:

1. Knowledge of liquid measures (English & metric).
2. Conservation of smaller to larger units over time and rate.
3. Problem solving.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Measurement of water wasted as school water fountains continuously run.
   1. How much water is wasted from a leaky faucet?
   2. Discuss number of students in class versus amounts of water used on an average (60 gallons) per person per day. Number of people in the community.
   3. Procedures:
      a. Use containers expressing English and metric units of measurement (cups, pints, quarts and gallons).
      b. Compute amounts collected per hour in relation to number of hours in school day, week, year, etc.
   4. Computations:
      a. Using English and metric graduated containers collect

(Continued)

Outside or Community:

A. Field trip to waste treatment plant.
   1. How many gallons of water a day are used?
   2. What is added to this water?
   3. Controls concerning water usage.
B. At home.
   1. Tabulations--follow the directions as outlined for the inclass activity.
      a. Kitchen.
      b. Bathroom.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

Air and Water Pollution, Gerald Leinwand and Gerald Popkin, Washington Square Press

Any publication giving the population size of your community such as a state map or Blue Book.

Audio–Visual:

Films:

Water Famine, Carousel Films, Inc., New York

Problem With Water Is People, McGraw-Hill

Kit:

Aggradation - Degradation, Eye Gate, 1970, ICE RMC, KT 5

Community:

Community Water Department

Sewage plant

CLASSROOM (Continued)

the amount of water wasted by a continuously running school water fountain. Collect the water wasted for a five-minute period for each fountain in the school.

b. Using the amount collected compute the amount wasted per hour, day, week, year, etc.

c. Using the factor that the amount of water used by the average person per day is 60 gallons, compute:

1) Amount of water used by the class per day.
2) Amount of water used by the community per day.
3) Amount of water used by the state per day.
4) Amount of water used by the nation per day.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

CONCEPT NO. 4 - Water

ORIENTATION Need for Pure Water

Integrated with:

SUBJECT Social Studies, Science, Language Arts, Art

TOPIC/UNIT Pollution

BEHAVIORAL OBJECTIVES

Cognitive:

Importance of a pure water supply on all living things and how it is used by them.

Evaluate the factor of heat as a pollutant although it does not add any foreign substance to the water.

Affective:

Recommend that a realization of the necessity of water should lead to a concern for and conservation of the natural resources.

Praise or criticize the water quality of his area, thereby showing the desire for pure water.

Skills Used:

1. Observation and drawing of conclusion.
2. Ability to do research.
3. Giving of an oral report.
4. Map reading.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Social Studies
- A. Study the rainfall map, also the map of the world's population. Compare. Is there a relationship?
- B. Study the location of the major dams in the U.S. or in the world. What relationship do they have to the population of the given area?

II. Science
- A. Experimentation. Have several plants, the same size, health and kind. Wet with water containing varying degrees of pollution from local sources.
- B. Observe and draw conclusions.
- C. Discuss how polluted water has affected life in our immediate environment.

III. Language Arts
- A. Give oral reports on topics suggested in outside activities.

(Continued)

Outside or Community:

I. Social Studies
- A. Library - Investigate which diseases are carried through water?
- B. List cities located in desert areas. What makes this possible?
- C. What effect has polluted water had on the fishing industry? Take those located on the Pacific, for example.
- D. Do research on Europe's pure water problem or other highly industrialized areas.
- E. Invite a resource person to give a talk on local water pollution problems caused by industry, farmers, etc.
- F. Invite a representative of industry to talk on pollution problems and the economic effect a fight against it

(Continued)

SUGGESTED RESOURCES

Publications:

"Wanted for Murder - Water Pollution", report or speech
"What You Can Do About Water Pollution", U.S. Department of the Interior
Ecological Effects of Hot Water Discharged by an Electrical Power Generating Plant, Thomas Graham, ICE RMC, 140 Gr
The United Nations and the Human Environment, ICE RMC, 100 Un
Resources and Man, "Food From The Sea", ICE RMC, 100 Na

Audio-Visual: (Continued)

Films:
The 1st Pollution, Stuart Finley, Inc., ICE RMC, Film #450
Still Waters, McGraw-Hill, ICE RMC, Film #510
Atomic Power Today-Service With Safety, ICE RMC, Film #420

Filmstrip:
Ecological Imbalance: Six Systems Dispoiled, Eye Gate, ICE RMC, FS St 2

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

PUBLICATIONS (Continued)

Write to:
Office of Water Programs, Environmental Protection Agency, Crystal Mall - Building #2, Washington, D.C. 20242
World EQ Index, Department of WEQI, National Wildlife Federation, 1412 - 16th Street, N.W. Washington, D.C. 20036

CLASSROOM (Continued)

B. The students could write their reaction to what they have discovered about water pollution (poems, editorials, etc.).

OUTSIDE ACTIVITIES (Continued)

would have on the community.
G. Consult county or city water sanitary personnel for a classroom speaker.

II. Science
A. Investigate the water cycle.
B. Study animal adaptations.
C. Visit sites of various degrees of water pollution. Observe plant and animal life...make comparisons.
D. Visit a nuclear power plant and investigate the relationship between water poliution and hot water discharge.

III. Language Arts
A. Find examples of writings about water pollution (poems, essays, etc.).
B. Send writings to magazine "Kids for Ecology", P. O. Box P-7126, Philadelphia, PA 19117, for possible publication.

E. S. E. A. Title III — PROJECT I-C-E 59-70-0135-4

Environmental:

Integrated with:

CONCEPT NO. 4 - Water

SUBJECT Art

ORIENTATION Water Supply

TOPIC/UNIT Multi Media

BEHAVIORAL OBJECTIVES

Cognitive:

Construct a painting or collage that will be similar in design and color to that of a given micro-organism colony.

Compare water from several sources.

Affective:

Defend the existence of the microscopic world even though they may not be visible to naked eye.

Skills Used:

1. Painting.
2. Printing.
3. Collage.
4. Design.
5. Charcoal painting.

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

A. Repeat pattern.
   1. Collect your own water (pond, river, stream, lake).
   2. View the micro-organisms of the water through a microscope or a projecting micro-scope.
   3. Discuss the patterns found in the micro-organisms.
   4. Design your own (repeat) patterns using paints, char-coal painting, collages, or choose an interesting pattern viewed from the water.

Outside or Community:

A. Go on a field trip to collect different types of water.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	
Audio–Visual:	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 4 - Water **SUBJECT** Science

ORIENTATION Effects of Fertilizer and Detergents on Plants & Animals **TOPIC/UNIT** Water Pollution

BEHAVIORAL OBJECTIVES

Cognitive:

Construct a demonstration test, how the actions of man can pollute the water supply.

Explain why nitrates and phosphates are classified as pollutants when their use by farmers is to increase crop yield and quality.

Affective:

Express his judgment as to his responsibility in keeping our streams unpolluted.

Request that his mother use detergents with low phosphate contents as a way of reducing the pollution of a water supply.

Skills Used:

1. Experimentation.
2. Drawing conclusions.
3. Critical thinking.
4. Surveying.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Simulate by experimentation, detergent and fertilizer-polluted water.
   1. Fill six quart jars 3/4 full of water.
      a. In jar 1, put elodea or some other fresh water plant.
      b. In jar 2, put algae.
      c. In jar 3, put algae and elodea.
      d. In jars 4, 5 and 6, put 12 daphina.
   2. Put jars 1 and 4 at window in light. Add nothing further to them.
   3. Obtain a phosphate detergent or a small amount of trisodium phosphate and some fertilizer.
   4. Put 1/2 teaspoon of detergent or trisodium phosphate in each of jars 3 and 5. Place at the window in light.

(Continued)

Outside or Community:

A. Investigate which brands of detergents are lowest in phosphates.
B. Survey neighborhood to see which detergents are most commonly used and whether they are high or low in phosphate content.
C. Find out which detergents are most popular in several grocery stores.
D. Have a representative from the sewage treatment plant or the DNR visit the class to explain phosphate and nitrate pollution.
   1. Sources.
   2. Effects.
   3. Treatments.
   4. Remedies.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

Science: Generating Ideas, 1972, American Book Company
Biology Teacher's Handbook, 1963, Schwab, John Wiley & Sons, Inc.
Everyman's Guide to Ecological Living, 1971, Cailliet, Setzer, Love, MacMillan Company, ICE RMC, 110 Ca

Audio-Visual:

Films:
Stream, ICE RMC, Film #320
Rise and Fall of the Great Lakes, ICE RMC, Film #240
Filmstrip:
Soaps, Detergents and the Environment, free from Information Application, Inc., P. O. Box 28, New York, NY, also ICE RMC, FS St 15

Community:

DNR representative

CLASSROOM (Continued)

5. Put three teaspoons of fertilizer in each of jars 2 and 6. Place at the window in light.
6. Examine jars and record results.
   a. The next day...what happened to the daphina in jars 5 and 6?
   b. After 3 or 4 days...what happened to the fresh water plant in jar 3, and the algae in jars 2 and 3?
7. Draw conclusions.
   a. How do large amounts of phosphate containing substances affect plants and animals in water?
   b. How does it get into waterways, and how can we prevent this from happening?

   Information for teacher: Algae will grow rapidly; animal life will die.

B. Design an experiment with water from various sources in your own community to see if algae will grow at an advanced rate, and if it is able to sustain life.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 5 - Air

SUBJECT Language Arts

ORIENTATION Air

TOPIC/UNIT Creative Writing, Graphics

BEHAVIORAL OBJECTIVES

Cognitive:

Through the use of a TV commercial technique, visually demonstrate to the other students the significance of air pollution:

a. Diseases and complications.
b. Reaction to materials used in building.
c. Cost of removing pollutants.

Affective:

Promote the fact that air pollution is a big problem and is everyone's responsibility.

Skills Used:

1. Creative writing.
2. Convincing someone of the significance of an issue.
3. Power of persuasion.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Making TV commercials.
   1. Brainstorm kinds of air pollution (put on board).
   2. Divide class into groups of 3 or 4.
   3. Each group picks one kind of air pollution and will demonstrate what causes their kinds of air pollution, and offer suggestions as to what can be done to improve air quality.
   4. Each group will then create a TV commercial on a paper scroll shown through a cardboard box TV set.
   5. Any form of creative writing could be used as the verbal part of the commercial, such as poetry, songs (original), narration. Drawings could be in color or black and white.

Outside or Community:

A. Contact local radio station or TV station to see if commercials made by students could be recorded for use by the station.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Magazines Newspapers Pamphlets Conservation Department DNR **Audio–Visual:** Kit: Our Environment 4 - Atmosphere, EMC Corporation, ICE RMC, KT 32 Previous to activity, watch commercials at home and observe: Type of message Length of message Impact of message Type of graphic **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 5 - Air **SUBJECT** Art

ORIENTATION Clean Air **TOPIC/UNIT** Construction

BEHAVIORAL OBJECTIVES

Cognitive:

Reproduce replicas of several causes of air pollution.
a. Factory
b. Auto
c. Etc.

Affective:

Demonstrate his awareness of the causes of air pollution by identifying causes in non-school situations.

Skills Used:

1. Discussion.
2. Observation.
3. Construction.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. After the students have visited the factory site, have them construct a factory, a bus, a car--using cardboard, boxes, etc. Dry ice could be used to create smoke, thus producing the causes of pollution.

Outside or Community:

A. If there is a factory in the area, take a field trip and do a charcoal drawing. How does a factory affect clean air?

B. Take the class to a busy intersection and have them observe. Draw the effect that many cars have on the clean air.

C. For extended study of traffic, use ICE field guide activity, "Don't Use Traffic Jam on Peanut Butter Sandwiches". Available at ICE office.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: "Box Sculpture", D. Hills, Arts & Activities, p. 42, May '70 "S.I.T.E.", a suggested answer to the problem of pollution in art teacher development, A.W. Beck, il., School Arts, 71:36-7, Sept. '72 "In Quest of Cleaner Air and Water", DNR, ICE RMC, VF Conserving Our Waters & Cleaning the Air, American Petroleum Institute, ICE RMC, 170 Pe **Audio-Visual:** Record: Why Is There Air, Bill Cosby **Community:** Factory representative Traffic department representative	

E. S. E. A. Title III — PROJECT I—C—E 59—70—0135—4

Environmental:

CONCEPT NO. 5 - Air

ORIENTATION Air Pollution

Integrated with:

SUBJECT Science (Mathematics)

TOPIC/UNIT Air, Graphing

BEHAVIORAL OBJECTIVES

Cognitive:

Determine the implications of air pollutants on his environment and use the data from his experiments to justify his answer.

Affective:

Alert to the problem of air pollution in his community by selecting newspaper articles or news items that illustrate the extent of the problem in his community, state, nation or world.

Discuss the implications of air pollutants with others outside of the school setting.

Skills Used:

1. Experimentation.
2. Recording.
3. Graphing.
4. Discussing.
5. Concluding.

STUDENT—CENTERED LEARNING ACTIVITIES

In-Class:

A. Prepare a series of five or six glass slides.
   1. Number each slide.
   2. Spread a thin coat of vaseline on each slide.

B. Place the slides at various locations in the school building and outside area.

C. Record the number of slide, the location of each, the time of sampling, the temperature, humidity, wind velocity, wind direction and any extraneous factors that may affect the sample.

D. After two hours collect the sample.

E. With the use of a hand lens or microscope count the number of particles according to kind. The three primary types of particles are soot, fibre and pollen.

(Continued)

Outside or Community:

A. Experiment can be repeated at various points in the home.

B. Experiment can be conducted before and after a rainfall.

C. Visit a factory to investigate controls on particulate matter (soot, flyash, dust, etc.).

SUGGESTED RESOURCES

Publications:

"Study of Air-Water Pollutants and Their Relationships", Dec. '71, National Science Found., ICE RMC, VF

"Air Pollution", Los Angeles Times, Jan. 6, 1972. ICE RMC, VF

Audio–Visual:

Films:
Air Pollution, BAVI
Poisoned Air, BAVI

Community:

Paper mill, factory, etc.

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

1. Soot - irregular in shape and usually dark in color.


Fig.1

2. Fibre - threadlike in appearance.


Fig.2

3. Pollen - very regular in shape. Appears as a miniature seed.


Fig.3

F. Compute the area of the glass slide using a centimeter scale.
G. Calculate the particles per square centimeter for each type of air pollutant.
H. Using a bar graph, graph the number of particles for each location.
I. Graph the number of particles with respect to type for each location.
J. The student may also graph the density of each type of particle for each location.
K. Class discussion on the kinds of pollutants, their source, and the effects of each on the human body.
L. Discussion on the filtering effects of rain, trees, etc.

DATA SHEET

Time of sample _____ Length of sampling time _____

Temperature at time of sampling _____

Wind Direction _____ Wind velocity _____

Humidity _____

Slide No.	Area Samples	No. of Particles Pollen	Particles Per cm^2

No. of Soot Particles	Particles Per cm^2	No. of Fibres Particles	Particles Per cm^2	Total No. of all Particles

Environmental:

Integrated with:

CONCEPT NO. 5 - Air

SUBJECT Science, Health

ORIENTATION Smoking

TOPIC/UNIT Air Pollution

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

BEHAVIORAL OBJECTIVES

Cognitive:

Describe orally and through experiment the effects of polluted air on a person's respiratory system.

Affective:

Understand the hazards of cigarette smoking.

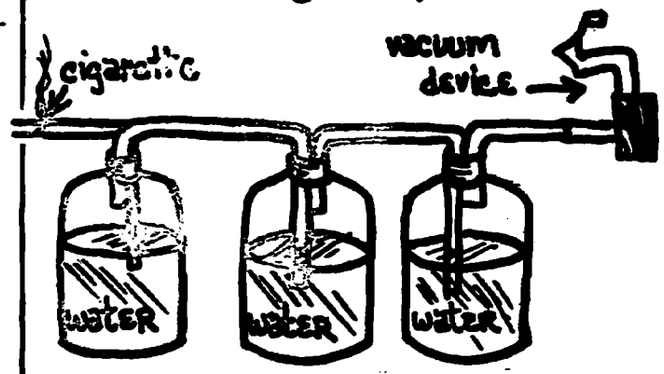
Skills Used:

1. Experimentation.
2. Observation.
3. Drawing conclusions.
4. Discussing.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Construction of a smoking machine.
   1. Construct a smoking machine using three one-gallon jars complete with two-hole stoppers, glass tubing, rubber tubing and faucet vacuum device. (See Figure 1).



   2. Light the cigarette and turn the faucet on to produce suction in the system.
   3. The student will observe materials trapped in the water-filled jars,

(Continued)

Outside or Community:

A. Contact the American Cancer Society for further information and a speaker.
B. Students might identify persons in the community who are in some way knowledgeable in quality of air. Air pollution interviews might be conducted by individual students.

SUGGESTED RESOURCES

Publications:

American Cancer Society pamphlets
IIS Biology, Wong and Dalmatz, p. 182-186, 1971, Prentice Hall
Concepts in Science, Harcourt, Brace & World, Inc.
Interaction of Man and the Biosphere, Rand McNally & Co.
Air and Water Pollution, Permabound Books

Audio-Visual:

Films:
Evils of Smoking, American Cancer Society
Risk, Talking Pictures Sources, Inc.
Life In A Cubic Foot of Air, BAVI
Poisoned Air, BAVI
The 2nd Pollution, Stuart Finley, ICE RMC, Film #460
Air Pollution: Take A Deep Deadly Breath, library

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

which act as filters of the respiratory system.

B. Discuss the possible effects of cigarette smoking as well as other forms of air pollution on the respiratory system.
   1. What are the effects of sitting in a smoke-filled room?
   2. What are the effects of living near a factory?

Environmental: Integrated with:

CONCEPT NO. 6 - Resources SUBJECT Science

ORIENTATION Variety of Environment TOPIC/UNIT Biomes

E. S. E. A. Title III -- PROJECT I-C-E 59-70-0135-4

BEHAVIORAL OBJECTIVES

Cognitive:

Explain that physical features such as climate, altitude and moisture interact with a land or water area to produce a community called a biome.

Will judge whether a given description of plants, animals and physical features represents a biome or not and give his reasons.

Affective:

Suggest that the biomes will change as a result of increased air pollution, increased water pollution or increased destruction of the quality of any environment within the home.

Skills Used:

1. Observation.
2. Discussion.
3. Making comparative studies.
4. Setting up a terrarium.

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

A. Show pictures of various biomes and discuss how they differ.

B. Take a field trip to different communities such as a swamp, pasture range or forest. Note the following for each community visited:
   1. Plant life.
   2. Animal life.
   3. Temperature.
   4. Nature of soil or water.
   5. Effects of wind.
   6. Exposure.
   7. Moisture.
   8. Characteristics of total area.

C. Class discussion.
   1. How did the plant life differ from one community to another? Why? What factors in the environment determine the growth of the plants noted.
   2. Compare the animals found in each community. Why did they choose their respective habitat?

(Continued)

Outside or Community:

A. Have a soil conservationist come in and give a talk on soil types and what vegetation and animal life will be found in these certain areas.

SUGGESTED RESOURCES

Publications:

The Natural Resources of Wisconsin (or any other state), The Natural Resources Committee of State Agencies, Madison, WI
The World of Living Things, Paul Brandwein and others
The Fundamentals of Ecology, Eugene P. Odum
Design for Life, Richard F. Trump and Davis L. Fagle

Audio-Visual:

Films:
Why Plants Grow Where They Do, Coronet
Our Natural Resources, BAVI
Life in the Hot Rain Forest, BAVI
Life in the Forest - North America, BAVI
Life in Grasslands, BAVI
Life in the Sahara, BAVI
Life on the Tundra, BAVI
Life in the Western Marshes, BAVI

(Continued)

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

AUDIO-VISUAL (Continued)
Filmstrip:
Ecology and Man Series, McGraw-Hill, ICE RMC, FS St 10

CLASSROOM (Continued)

3. Which soil contained the most humus? Where was more erosion evident? Why?
4. How does the availability of water determine plant growth?
5. How do temperature and moisture interact to produce the climate of the region?
6. Study maps of biomes of the world. Try to account for the characteristics of the major biomes of the world.
7. How does altitude affect biomes?
8. What are the biomes of your local area?
9. What is the significance of a biome? Why should one have an understanding of world communities?
10. What principles of soil, water, forest and wildlife conservation do you learn from the study of biomes?

D. Class projects.
1. Make a detailed study of a local biotic community.
2. List riches in a community.
3. Set up terrariums showing various types of biomes.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 6 - Resources SUBJECT Art, Social Studies, Language Arts

ORIENTATION Variety in Environment TOPIC/UNIT Biomes

BEHAVIORAL OBJECTIVES

Cognitive:
Construct a bulletin board consisting of various biomes. Included in this will be pictures of plants, animals, homes and land surface of that geographical region.

Affective:
Through research, demonstrate that he is able to critically analyze how man is dependent on the various geographic conditions peculiar to the region.

Skills Used:
1. Bulletin board.
2. Study of homes around the world.
3. Observation of animal homes on a nature walk.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Art
- A. Construct a bulletin board "Biomes of the World" with the categories: jungle, desert, polar and temperate.
- B. Student should collect pictures of wildlife, plants, people and homes from the four biomes for the bulletin board.

II. Social Studies
- A. Students should discuss the four biomes incorporating the following questions:
  1. Why do people make their homes as they do?
  2. Why is a home made of adobe in a desert?
  3. Why are some homes made of canvas in certain regions?
  4. Why a tree house?

(Continued)

Outside or Community:

I. Art
- A. Take walk through nature trail. Look for animal homes. (bird, raccoon, skunk, mice, squirrel, rabbit, etc.) Draw or paint pictures of animals and their homes which were observed. Or, make clay sculptures or a diorama.

II. Social Studies
- A. Invite a foreign exchange student to speak to class on how people in his country have adjusted to their environment.
- B. Have agriculture agent speak to class on how a farmer within the state adjusts his crop growth to water supply, soil quality, and weather conditions.
- C. Have students interview people within the community to see

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

Time-Life Books, ICE RMC, 100 Ti
Wild Alaska, Baja California, Atlantic Beaches, The Northeast Coast, The North Woods, The Everglades

Audio-Visual:

Filmstrips:
Wambo and Tawa of the Hot Lands
Ahmed and Adah of the Desert Lands
Nannook and Okawa of the Cold Lands
Plants We Know

Films:
Homes Around The World, Coronet
Animal Habitats, BAVI
Why Plants Grow Where They Do, BAVI
Dairy Farm, Coronet, BAVI
(Continued)

Community:

Chamber of Commerce
Agriculture agent
County agent
Water Department head
County Forester
Home under construction
Conservation warden
Nature trail
Farm

AUDIO-VISUAL (Continued)

Films:
New House: Where It Comes From, Coronet, BAVI
Our Natural Resources, Dowling, BAVI
Our Earth, Colburn, BAVI
Life in the Hot Rain Forest, Coronet
Life in the Hot Wetlands, Coronet
Life in the Forest - North America, BBI
Life in the Grass Lands, EBF
Life in the Sahara, EBF
Life on the Tundra, EBF
Life on the Western Marshes, Film Board of Canada

CLASSROOM (Continued)

5. How do people use plants of a particular environment?
6. Why can't every plant grow anywhere?
7. Why are there few plants in a polar region?
8. What determines a farming community?

III. Language Arts
- A. Student exchange letters with other sixth grade students of different areas.
- B. Read the letters received to the class when they arrive.

OUTSIDE ACTIVITIES (Continued)

- C. how they are dependent on the geographic conditions of the area.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 6 - Resources

SUBJECT Social Studies, Language Arts

ORIENTATION Resource Usage

TOPIC/UNIT Social Studies

BEHAVIORAL OBJECTIVES

Cognitive:

Comparative report on the natural resources found in an economically well-to-do country and a country with economic difficulties that indicates the effect of natural resources available on the countries.

Affective:

Suggest ways that we can conserve resources at home and in school.

Skills Used:

1. Research.
2. Reporting.
3. Comparing.
4. Discussion.
5. Letter writing.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Social Studies
   - A. Show film of an underdeveloped nation and how these people's lives differ from ours.
   - B. Divide the class into groups. Have each group do a comparative study of and report on natural resources found in:
     1. an economically well-to-do country.
     2. a country having economic difficulties.
   - C. Compare the standard of living in the various parts of the U.S. and the natural resources found near each.
   - D. Discuss why it is necessary to begin the process of recycling for the U.S.
   - E. What group actions are being taken to encourage recycling?

(Continued)

Outside or Community:

A. Invite an exchange student to compare life, economically, between the U.S. and his home country.

B. Invite director of local recycling program to speak to class.

SUGGESTED RESOURCES

Publications:

Encyclopedias

Readings in Environmental Awareness, Office of Education, Dept. of Health, Education and Welfare, Washington, D.C.

Everyman's Guide to Ecological Living, Greg Cailliet and Paulette Setzer, 1971

Audio-Visual:

Films:

Homes Around The World, Coronet, BAVI

Recycling, Environmental Protection Agency, Modern Talking Picture Service, Inc.

Kit:

Aggradation - Degradation, Eye Gate, ICE RMC, KT 5

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

II. Language Arts

A. Discuss what actions we can take to encourage recycling of usable material.

B. Decide on projects to carry out in class as suggested in the outline.

C. Outline for establishing an effective recycling center. (Adapted from Everyman's Guide to Ecological Living, 1971, MacMillan Co.)

1. Ascertain the quantity of material available in your area for recycling.
2. Determine how much material can actually be collected.
3. Arrange for a work force large enough to handle the material.
4. Make sure there is a market within a reasonable distance for the materials you are collecting.
5. Make sure transportation is available.
6. Publicize what you are doing, why you are doing it and where the collection points are located.

D. Write letters to local officials to promote recycling projects.

E. Compose list of suggestions for recycling in the home and duplicate to be sent home.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 6 - Resources

SUBJECT Art

ORIENTATION Resource Distribution

TOPIC/UNIT Pen and Ink Line Problems

BEHAVIORAL OBJECTIVES

Cognitive:

Draw a figure or an outdoor scene that will have at least three types of lines using sticks, ink and colored paper.

Affective:

Sensitive to a variety of lines in common objects.

Skills Used:

1. Basic pen and ink drawing techniques.
2. Appreciation.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss lines (using any visual aids at your disposal). Lines in nature.
   1. Have students brain-storm on all the different types of lines that they can see in their class-room. (thick, thin, curved, zig-zag, etc.)
   2. Show the filmstrip, The Art of Seeing (Line).
   3. Discuss and illus-trate various pen and ink techniques. Show the students that an assortment of sticks dipped in ink will produce a variety of effects. The end of the stick may be pointed, notched or covered with a piece of cloth.
   4. A typical problem might be drawing a person or an outdoor scene using natural tools.

Outside or Community:

A. Do some outdoor sketching.

B. Take a field trip to a wooded area or around the neighborhood to discover the variety of line in nature.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: "Pen and Ink Drawing", Faubes, Frederic, Pitman Pub. Co. "Line Design", Arts & Activities, Feb. '70 "For Those Who Look But Do Not See", School Arts, Nov. '70 "Line", Fine Arts Publication, FA 102, ICE RMC **Audio-Visual:** Filmstrip: The Art of Seeing (Line), Warren Schloat Pro. Inc. **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

CONCEPT NO. 7 - Land Use

ORIENTATION Influence for Change

Integrated with:

SUBJECT Social Studies, Science, Math

TOPIC/UNIT Population Growth

BEHAVIORAL OBJECTIVES

Cognitive:

Explain factors in population growth and how this growth will result in changes in land use from what the land is presently used for:

a. Amounts and percentages.
b. Types of land used for each purpose.

Affective:

Suggest how the increased birth rate in their community will affect land use and population density.

Volunteer ways in which this population growth can harm their own personal well being.

Skills Used:

1. Collecting.
2. Organizing.
3. Making tables, charts, graphs.
4. Making judgments.
5. Experimentation.
6. Concluding.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Social Studies
   A. Show movie, Family Planning. Film may be too mature for some sixth graders. Teacher should preview film to determine suitability for class.
   B. Discussion questions
      1. Discuss concepts in film.
      2. Further discussion questions.
         a. Based on our studies of animals, how may human behavior change due to overcrowding?
         b. Is there a relationship between stress diseases such as heart disease, ulcers, etc. and overcrowded conditions?
         c. How can a population explosion be connected with loss of democratic

(Continued)

Outside or Community:

A. Collect the birth and obituary columns for three weeks from their local newspaper.
   1. Compare and chart the birth and death rate.
   2. Give individual reports on population increase.
   3. Discuss the effect this increase will have on their community.

SUGGESTED RESOURCES

Publications:

Population Bomb, Paul Ehrlich
Newspapers
For the Teacher:
Huxley, Julian: "Are There Too Many of Us?" Horizon Fowler
H. Seymour: "The Population Explosion and Education," The American Biology Teacher
"How Many People? How Much Food?" Science World
"The Baby Riddle", Life Magazine, May, 1972

Audio-Visual:

Films:
Family Planning, Walt Disney, ICE RMC, Film #230
Food and People, EBF, BAVI
Filmstrips:
Crisis of the Environment, New York Times, ICE RMC, KT 6

Community:

City engineer
Project I-C-E representative

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

freedoms? (Enough individual development cannot be provided; therefore, government must exert more control.
d. What problems do we associate with overcrowding of cities?
e. Can we as citizens do anything about controlling population size?
f. How can man work to stabilize populations and plan long-range conservation?

II. Science
A. Experimentation
1. Materials needed.
a. A 3-square foot area of ground. Either an outside plot or an indoor garden laboratory could be utilized.
b. Radish seeds.
2. Activity.
Divide the control area into four rows.
a. Row 1 - Plant seeds one inch apart.
b. Row 2 - Plant seeds 1/2 inch apart.
c. Row 3 - Plants seeds 1/4 inch apart.
d. Row 4 - Plant seeds 1/8 inch apart or space according to class discretion.
3. Observations and recording.
a. Average plant height per row should be recorded each day.
b. Leaf form should be noted.
c. Upon termination, root form should be noted.
4. Calculation.
a. Graph time vs. average plant height for each row.
5. Conclusions.
a. Draw conclusions on the growth behavior of the plants due to overcrowding.
B. Discuss how people react similarly to the plants. What conclusions can be drawn?

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:** Social Studies, Art

CONCEPT NO. 7 - Land Use **SUBJECT**

ORIENTATION Leisure Time **TOPIC/UNIT** Tourism

BEHAVIORAL OBJECTIVES

Cognitive:

Make a booklet showing the causes and effects of tourism on the environment that tourists come in contact with. The booklet will have both written and pictorial expression.

Affective:

Suggest making improvements of the impact of tourism in their communities.

Skills Used:

1. Reflective thinking.
2. Planning.
3. Observation.
4. Road map reading.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Social Studies
   A. Show film, Nation of Spoilers.
   B. Discuss places where students and families spend their vacation. Have them write a report or plan a trip using these points.
      1. Means of travel.
      2. Activities engaged in.
      3. Accommodations of local environment for these activities.
      4. Influence of activities on environment.
      5. Effects on environment when too many people want to do the same thing.
   C. Write a report as to why vacationing is becoming more of a possibility for many because of:
      1. Economic conditions.

(Continued)

Outside or Community:

A. Outdoor observation. Make a list of recent changes which students observe as they vacation in the same area (to demonstrate how tourism affects the environment). Make a booklet or collage to show an understanding of this concept.

B. Write to the Chamber of Commerce in Door County and Wisconsin Dells for information.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

Green Bay Press Gazette and Advocate, relevant articles

Audio-Visual:

Films:
Our Changing Environment, BAVI
Nation of Spoilers, Wisconsin Department of Natural Resources
Revir - An Allegory, Montclair State College, New Jersey

Community:

CLASSROOM (Continued)

2. Increased leisure time.

D. Locate pictures of various kinds of vacations.

E. Compare how tourism affects Door County and Wisconsin Dells.
1. Economically.
a. Transportation.
b. Recreation.
c. Housing.
2. Environmentally.

F. Effects of tourism on residents.

II. Art

A. Make a bulletin board display of advertisements which lead to changes in land use and population density and the effects of leisure time on the environment.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 7 - Land Use **SUBJECT** Art

ORIENTATION Population Growth, Leisure Time **TOPIC/UNIT** Box Sculpture

BEHAVIORAL OBJECTIVES

Cognitive:

Determines types of buildings needed for family living and leisure time activities through use of experimental procedures in a community-type survey.

Construct a model of structures suitable for housing of a given population and area of land.

(Continued)

Affective:

Demonstrate awareness of the variety of homes and leisure activities by making a list of types observed in a given section of the community.

Skills Used:

1. Cardboard sculpture.
2. Appreciation.

STUDENT--CENTERED LEARNING ACTIVITIES

In-Class:

A. Creation of buildings from boxes.
   1. Population growth can be the center of interest, if size and type of building are stressed in connection with family living:
      a. Small house.
      b. Large house.
      c. Apartment building.
      d. "A" frame house.
      e. Grass hut.
      f. House on stilts.
      g. Adding new rooms to an old house (remodeling).
   2. Leisure time can be stressed by asking what types of buildings are needed to satisfy man's recreational needs:
      a. Golf-clubhouse.
      b. Beach houses.
      c. Stables.
      d. Taverns, lounges.
      e. Bowling alleys, etc.

(Continued)

Outside or Community:

A. Walk in the neighborhood to determine the different types of homes in your own areas.
B. Resource books to see unfamiliar types of homes. Books on architecture.

SUGGESTED RESOURCES

Publications:

"Box Sculpture", L. Hills, Arts & Activities, p. 42, May '70
"Architectural Design in the Classroom", T. Thatcher, il., School Arts, 68:7 March '69
"Cardboard City: Mixed Media", R. R. Guthrie, il., School Arts, 68:32-3, Sept. '68
Our Man Made Environment, ICE RMC, 120 0

Audio-Visual:

Film:
Designing With Everyday Materials: Corrugated Paper, BAVI

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

B. Followup reports. Students can show their creations and explain their use.
   1. Is it a residential building?
   2. Who could live in it?
   3. Where might it be located?
   4. Is it a recreational building?
   5. Who would use it?
   6. Where would it be located?

COGNITIVE (Continued)

Construct a model of recreational facilities suitable for a given population.

Environmental: Integrated with:

CONCEPT NO. 7 - Land Use SUBJECT Mathematics

ORIENTATION Changes in Leisure Time TOPIC/UNIT Per Cent

E. S. E. A. Title III – PROJECT I-C-E 59-70-0135-4

BEHAVIORAL OBJECTIVES

Cognitive:

Compare (using the per cent of change problem) use of time, land, population density today with use of same during student's grandparents' time.

Affective:

Seek out opportunities for being able to use and influence others in the wise use of time, land, resources.

Skills Used:

1. Interviewing.
2. Collecting information.
3. Comparing.

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

A. Using data and information collected in outside resource activity at right, student will compare such changes as:
   1. Length of working day (hours).
   2. Length of vacations (days or weeks).
   3. Amount of money earned per day (dollars).
   4. Size of community in areas (blocks).
   5. Size of community in population (numbers).

B. Compute percent of change for each of the above using the following equation:

$$\frac{\text{Amount of Increase or Decrease}}{\text{Original value}} \times 100 = \text{Percent of Change}$$

C. Use information given by DNR representative to find percent of change in amount of land use for public recreation.

Outside or Community:

A. Each student will interview his parents and grandparents or elderly neighbor to collect data and information to use in showing percent of change in regard to items to be used in class activity at left; for grandparent or elderly neighbor, use 1948 as a base year. For parents use present as the base year. Specific interview questions might be:
   1. How many hours per day did you work?
   2. How many days/weeks of vacation did you get?
   3. How much were you paid per day?

B. Invite DNR, local tourist trade owner, local soil agent, forester, etc. to talk to class and give information as to amount of public land available for recrea-

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Our Precarious Habitat, Melvin A. Berarde, 1970 The Population Bomb, Paul R. Ehrlich, 1968 **Audio-Visual:** Films: The Squeeze, Mass Media Ministries Cities Are Different and Alike, BAVI Cities - How They Grow, BAVI **Community:** DNR representative Tourist resort owner or businessman County soil agent Forest ranger Curator of city or county park	OUTSIDE ACTIVITIES (Continued) tional use today and 1, 2, 5 and 10 years ago.

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Environmental: **Integrated with:**

CONCEPT NO. 7 - Land Use **SUBJECT** Art

ORIENTATION Land Use and Transportation **TOPIC/UNIT** Drawing or Construction

BEHAVIORAL OBJECTIVES

Cognitive:

Determines implications of new recreational forms on land use.

Explain the harmful effects of the increased snowmobile use on the environment.

Describe characteristics of an environment where it can be best used.

Affective:

Judges the problems brought about by the uncontrolled use of the snowmobile on land areas as being harmful in comparison to the assistance to wildlife.

Suggests new designs for snowmobiles that will lessen the harmful effect to the environment over which they travel.

Skills Used:

1. Sculpture.
2. Techniques with varied media:
   Design
   Construction
   Carving
   Drawing

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Snowmobiles are a new form of transportation, new form of recreation and necessitate changes in land use. Kids seem to love drawing and painting snowmobiles in their pictures so plan a lesson based on snowmobiles.
   1. Design own snowmobiles.
      a. Wood sculpture.
      b. Soap sculpture.
      c. Found object sculpture.
      d. Wire and papermache sculpture.
      e. Cardboard or tagboard sculpture.
      f. Snow sculpture.
   2. Design environment suited for snowmobile use--sandbox model, painting, drawing, chalk, etc. Include safety features.
   3. Make up a name for a new snowmobile.

(Continued)

Outside or Community:

A. Observe snowmobiles in use.
B. In spring, observe land areas where snowmobiles were used, to see damage they have created.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: "Wood Sculpture About Ecology", School Arts, April, '72, p. 34 **Audio–Visual:** Posters and manuals from present manufacturers **Community:**	CLASSROOM (Continued) B. Discuss advertising media used by present manufacturers, then plan your own advertising campaign. Study posters and billboards. 1. Students design posters. 2. Students design billboards.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 7 - Land Use **SUBJECT** Art

ORIENTATION Transportation **TOPIC/UNIT** Drawing, Sculpture

BEHAVIORAL OBJECTIVES

Cognitive:

Illustrate how modes of transportation have changed over the last 200 years.

Affective:

Demonstrate consciousness of the effect of technological developments on population areas brought about by changes in modes of transportation by identifying these in the community.

Participate in a discussion of ways that transportation has changed and the resulting effects on man's way of life.

Skills Used:

1. Drawing skills.
   a. Placement.
   b. Perspective.
2. Construction skills.
   a. 3-D models.
3. Line drawing

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Precede art activity with discussion of how transportation improvements have transformed areas of population density and how land use has changed along with this mobility of people. Sample questions:
   1. What were the forms of transportation in the early 1900's?
   2. How were streets & roads constructed?
   3. What inventions facilitated transportation?
   4. Increased mobility had what effect on modes of living?
   5. Why did city cores become industrial centers and outlying areas become population centers?

B. The art activity itself consists of drawing models of or creating 3-D models of the transportation systems which have produced these

(Continued)

Outside or Community:

A. Field trips to historical museums having old cars, trains, etc. (National Railroad Museum, Green Bay.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	CLASSROOM (Continued) changes. Examples: Model T, cameras, steam engines, monorails, bi-planes, 747 jets. C. Work in groups constructing large models of these things using cardboard, junk metal, etc. Have plastic or real models, slides, pictures, etc. of these machines for the class to observe.
Audio–Visual: Pictures of old and new transportation modes. Plastic models of cars, planes, etc. Slides showing modes of transportation.	
Community: Museums Railroad museum Airport	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 8 - Values and Attitudes **SUBJECT** Social Studies, Math, Language Arts, Art

ORIENTATION Attitudes **TOPIC/UNIT** Pollution

BEHAVIORAL OBJECTIVES

Cognitive:

Construct an oral or written report explaining how cultural, social, economic, and political factors affect the attitudes of an individual or group towards their environment.

Estimate the long-range effect of litter and portray it in graph form from data available in the school setting.

Affective:

Investigate the fact that many factors influence man's attitude toward his environment.

Suggest ways of solving the litter problem in his community.

Skills Used:

1. Interviewing.
2. Summarizing.
3. Reporting findings to class.
4. Graphing.
5. Discussion.
6. Estimation.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Social Studies
   - A. Discuss the causes of pollution.
     1. Have the students air their attitudes toward the problem.
     2. Point out the diversity of their opinions & allow students to state what factors have influenced them.
   - B. View film Time to Begin or Men At Bay.
   - C. Discuss the attitude the Indian has toward the environment, contrast this with other groups.

II. Math
   - A. Litter in the classroom.
     1. Dispense with janitorial services in the classroom for a period of time (at least 1 week)

(Continued)

Outside or Community:

I. Social Studies
   - A. Invite a speaker from an industry, the Audubon Society, county agent or fish biologist. Speak on questions such as: Are you very concerned about Lake Michigan? Why? Why not? What is your company or society doing about it?

II. Math
   - A. Investigation of littering in the community.
     1. Have children stand for about 30 minutes of a busy hour near a store, restaurant or garage and tally the litter dropped or thrown by passers-by. List according to types of litter and make a graph depicting the results.

SUGGESTED RESOURCES

Publications:

Pesticides: The Mist of Death, Bert Schwartz
Silent Spring, Rachel Carson
The Only Earth We Have, Lawrence Pringle
Man's Control of the Environment, Congressional Quarterly, 1970
ICE RMC, 100 Ma

Audio-Visual:

Films:
Our Vanishing Land, McGraw-Hill
Later...Perhaps, New Jersey State Council for EE, ICE RMC, Film #290
How We Look At Things, Kalamazoo Nature Center, Michigan
Time To Begin, Wisconsin DNR
Men At Bay, King Screen Prod., ICE RMC, Film #259
Garbage, King Screen Prod., ICE RMC, Film #260
The Stream, ACI Films, ICE RMC, Film #320

Community:

Great Lakes Basin Commission, Ann Arbor, Michigan 48106
Bay Lake Regional Planning Comm., Green Bay, Wisconsin 54301
Environmental Protection Agency, Chicago, Illinois 60606

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

Note the day-to-day accumulation of scrap paper, pencil shavings, paper towels, etc.
2. List and graph amounts of refuse accumulated from day to day.
3. Estimate yearly accumulation.

III. Language Arts
A. Develop questions to be used in interviews as suggested in outside activities.
B. Following interviews, students will write a report on the differences of attitudes. Have students state how each person was affected by the following:
1. Culture.
2. Economics.
3. Society.
4. Politics.

OUTSIDE ACTIVITIES (Continued)

2. To follow Exercise #1, suggest the following activity. Our community has a $50 fine for littering. How much money would have been collected "yesterday" in just our neighborhood if that law was enforced. Have students figure their individual totals; help them compile a final class total. Lead children to an appreciation of the economic effects of littering. Have them consider the cost of taxpayers for street cleaning, the cost to businessmen, etc.
3. Contact City Engineer to obtain this information.

III. Language Arts
A. Have students interview three to five people of different backgrounds on their feelings, values and attitudes toward their environment and their concern in maintaining a balanced ecosystem.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 8 - Values and Attitudes **SUBJECT** Art

ORIENTATION Man's Future Environment **TOPIC/UNIT** Drawing - Poster

BEHAVIORAL OBJECTIVES

Cognitive:

Construct posters or drawings that illustrate the future environment of a given area under:

a. Natural conditions of change.
b. Positive conditions of change.
c. Negative conditions of change.

Affective:

Weigh alternatives of man's environment.

Skills Used:

1. Drawing
   a. Charcoal.
   b. Pencil.
   c. Oil pastels.
2. Lettering
   a. Pen and ink.
   b. Cut letters.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Art history commentary.
   1. Students are to do a drawing or a poster of what he feels our future environment would be like if we keep using it as we have in the past and do nothing to try to conserve it.
   2. Students are to pretend that they are just like artists of the past who were actually reporters and futurists, commenting on the world around them.

Outside or Community:

A. Students could research to find works, done by artists of the past, which describe their reporter and futurist tendencies.
B. Students could also visit museums to actually see paintings of our reporter "futurist" artists.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

"Drawing With Mixed Media", M. B. Bowman, School Arts, 71:14-15, N. '71

"Environment: Children Explore Their School, Their Community, Their Values", C. S. Knapp, Instructor, 81:62-4, Jan. '62 and Feb. '72

Audio-Visual:

Film:
Poster and Introduction to Drawing Materials, BFA, BAVI

Community:

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Environmental: **Integrated with:**

CONCEPT NO. 8 - Values and Attitudes **SUBJECT** Art

ORIENTATION Environmental Awareness **TOPIC/UNIT** Political Convention Turned Environmental

BEHAVIORAL OBJECTIVES

Cognitive:

Illustrate environmental awareness by creating buttons, banners, etc. for an environmental convention.

Affective:

Desire to develop an environmental awareness in others by participating in the making of buttons, posters, etc.

Skills Used:

1. Drawing.
2. Lettering.
3. Applique.
4. Composition.
5. Printing.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Political convention.
   1. Students could do a takeoff on a political convention. Their convention could be an environmental convention.
   2. Create environmental buttons, bumper stickers, banners, circulation papers, posters, etc. for the convention.
   3. This is an excellent group activity and should give students an opportunity to work together and develop social adaptivity.
   4. This convention could actually develop into a contest if a class was broken down into groups of four and the group with the best campaign would win the environmental election.

Outside or Community:

A. Gather and study political campaign buttons, bumper stickers, banners, posters in relation to design, color, lettering, size, balance, etc.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: "Drawing With Mixed Media", M. B. Bowman, School Arts, 71:14-15, N. '71 "Color Combinations Made Exciting", K. G. Kite, Arts & Activities, 71:24-6, Feb. '72 "Photomantage the Juxtaposing of Images", D. Cyr, Arts & Activities, 66:26-9, Jan. '70 "Printing: Plant Prints", I. Geary, Instructor, 79:94, Jan. '70 **Audio-Visual:** **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 9 - Management

SUBJECT Social Studies, Science, Language Arts, Art

ORIENTATION Land Use

TOPIC/UNIT Natural Resources

BEHAVIORAL OBJECTIVES

Cognitive:

Demonstrate the proper use and steps necessary for the correlation of the misuse of natural resources.

Explain the ability of man to change and manipulate his new environment and name several inherent dangers in this practice.

Affective:

Appreciate the ability that man has to change and manipulate his environment.

Describe the inherent danger of that practice to others using several examples.

Skills Used:

1. Discussion.
2. Critical thinking.
3. Experimentation.
4. Comparing.
5. Reporting.
6. Dramatization.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Social Studies
   A. As introduction, show filmstrips, Man-Managed Ecosystems and Competitive Land Use from "Ecology and Man Series, set 3", McGraw-Hill (ICE RMC, FS St il).
   B. Class discussion.
      1. Discuss the differences between wants and needs.
      2. List on board the items that are man's wants and those that are man's needs.
      3. Discuss ways in which man has damaged or destroyed his environment through manipulative change.
      4. Compare primitive man to modern man and point out differences in life style.

(Continued)

Outside or Community:

I. Social Studies
   A. Field trip to an unproductive land area and suggest ways to make the area a suitable habitat for wildlife.
   B. Invite city planner to class to discuss how plans for development are made.

II. Science
   A. Research the effect of excess amounts of salt on small game.

SUGGESTED RESOURCES

Publications:

Plants, Man and Life, Edgar Anderson, University of California, Berkeley, 1967

A Different Kind of Country, Raymond F. Dasmann, MacMillan, 1968

Our Man-Made Environment, ICE RMC, 20 O

Man's Control of the Environment, Congressional Quarterly, 1970, ICE RMC, 100 Ma

Audio-Visual:

Films:

Boomsville, ICE RMC, Film #400

One Day At Teton Marsh, Walt Disney, ICE RMC, Film #200

Life Along The Waterways, Brown County Library

Urban Sprawl, Stuart Finley, ICE RMC, Film #430

Cry of the Marsh, ACI Films, ICE RMC, Film #390

Filmstrip:

Ecology and Man Series, Set 3, McGraw-Hill, ICE RMC, FS St 11

(Continued)

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

AUDIO-VISUAL (Continued)

Kit:

The Land Use Game, Education Ventures, Inc., ICE RMC, KT 25

Game:

Man In His Environment, Coca-Cola Co., ICE RMC, SG 4

CLASSROOM (Continued)

C. Use simulation game in which students have the opportunity as planners to discover ways which they can utilize land space with the least possible harm to the environment.
   1. The Land Use Game, Education Ventures, 1971
   2. Man In His Environment, Coca-Cola Co.

II. Science (Specific example of management)
   A. Salt effects on vegetation.
      1. The students will construct four terrariums (window boxes) and fill them with native vegetation.
      2. Maintain the terrariums with equal amounts of water and sunlight for about ten days.
         a. It will be necessary to measure equal amounts of water, soil, exposure to the sun and estimate the type and amount of vegetation in each box.
      3. Introduce a strong solution of salt water into box #1, a weaker solution into box #2, and no salt into boxes #3 and #4.
      4. Maintain a salting procedure for an additional ten days and carefully observe and record the progress of all four foxes.
      5. Salt solution must be carefully measured to insure constant dosage.
   B. Discussion
      1. Discuss the effects of salting highways and roads during winter months.

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	CLASSROOM (Continued) 2. The effects of irrigation and dams in arid climates. 3. The possible effects of sea water as irrigation source. III. Language Arts A. Drama 1. Groups will volunteer and develop skits--one dealing with life with only needs, and one with depicting life with abundant wants. Compare to life style. B. Discuss finding a balance between wants and needs to safeguard our environment.
Audio–Visual:	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 9 - Management **SUBJECT** Art

ORIENTATION Man's Environment **TOPIC/UNIT** Subtractive Sculpture

BEHAVIORAL OBJECTIVES	STUDENT–CENTERED LEARNING ACTIVITIES	
	In-Class:	**Outside or Community:**
Cognitive: Describe the characteristics of careful change and reckless change. Explain the irreversible process of change in an environment.	A. Man has the ability to change his environment, but there are some aspects of it that can only be changed so much before they collapse and as a strong, useful part of our environment, they are no longer of any use. (Through a sculptural activity we can demonstrate this fact.) B. A bundle of 15-20 straws are glued together using Elmer's glue, giving you a strong free form sculpture. C. Once your sculpture has dried take a cutting instrument and begin cutting sections and parts off your sculpture to make it more interesting. D. The success of this project for the student will illustrate the fact that man can remove and change things in his environment, but (Continued)	
Affective: Demonstrate awareness of the effects of uncontrolled changes in his environment by identifying examples.		
Skills Used: 1. Subtractive sculpture.		

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	CLASSROOM (Continued) it must be done carefully or he will end up ruining it just as the student will ruin his sculpture if he removes too much of his sculpture or cuts without thought.
Audio–Visual: Film: Designing With Everyday Materials: Straw, BFA, BAVI	
Community:	

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Environmental:

Integrated with:

CONCEPT NO. 10 - Economic Planning

SUBJECT Social Studies, Math

ORIENTATION Resource Use

TOPIC/UNIT Pollution

BEHAVIORAL OBJECTIVES

Cognitive:

Name several short-term gains and several long-term losses associated with a local industry in a short talk to the class.

Affective:

Participate in a class discussion evaluating whether long-term losses are worth the short-term economic gains.

Skills Used:

1. Research.
2. Reporting.
3. Critical reading.
4. Evaluation.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Social Studies
   A. Discuss briefly how each of the following led to economic gains but environmental losses:
      1. Discarding of cans, bottles, cars, etc.
      2. Use of enzyme detergents.
      3. Use of pesticides as DDT.
      4. Lumbering.
      5. Paper.
      6. Jets, snowmobiles, cars.
      7. Factory pollution.
      8. Excessive farming on the Great Plains.

II. Mathematics
   A. Develop activity with class.
      1. In a class discussion, set dollar values on the cost of discarding of cars, bottles, cans, garbage, etc. (Estimate using decimal fractions.)

(Continued)

Outside or Community:

A. Library research.
   1. Divide students into committees, giving each one topic on which to research. Have them make posters and give a short talk on each.

B. Investigation.
   1. Visit a nearby factory. Observe--What are the environmental losses and the economic gains?
   2. Take a field trip to a farmland that has been overfarmed and crops are poor.
   3. Take a field trip to Fox River to observe the polluted areas and discuss how man's demands have hampered the natural beauty of its river.
   4. Take pictures of areas that have been hampered by man's desire for economic gains.

(Continued)

SUGGESTED RESOURCES

Publications:

Man's Role in Changing the Face of the Earth, William L. Thomas, Jr. ed., Chicago Press, 1956

A Place To Live, National Audubon Society, ICE RMC, 110 A

1976: Agenda for Tomorrow, Stewart L. Udall, Harcourt, Brace & World, 1968

Audio-Visual:

Films:

Bulldozed America, Carousel Films, Inc.

Cry of the Marsh, ACI Films, Inc., ICE RMC, Film #390

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

2. Student groups will compose letters to:
   a. County Highway Dept. to check on the cost of picking up cans and bottles in the ditches.
   b. City Sanitation Department to check on cost of disposing of cans or bottles.
   c. City and County Police Departments to find the cost of towing away abandoned cars to junkyards.
3. After replies are received, compare actual costs to class estimation.
4. Is it worth the cost of removing cans and cars at public expense to have desirable environmental conditions?

OUTSIDE ACTIVITIES (Continued)

5. Have game warden, county forester or water department head talk to class on ways man's greed for economic gains has hampered their particular field.

C. Instead of writing letters to various departments suggested in the class activity, students might conduct interviews of people in these departments.

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Environmental: **Integrated with:**

CONCEPT NO. 10 - Economic Planning **SUBJECT** Physical Education

ORIENTATION Health **TOPIC/UNIT** Long Distance Running

BEHAVIORAL OBJECTIVES

Cognitive:

Explain the need for pacing in long distance running.

Evaluate the use of long distance as an analogy of natural resources.

Affective:

Present and defend one reason why they should pace themselves in distance running.

Skills Used:

1. Breathing.
2. Proper posture used when running.
3. Pacing oneself.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Teacher introduction.
   1. Long distance running.
      a. Safety.
      b. Positive effects.
      c. Fundamentals.

   Note: Impress upon the students the importance of pacing themselves and contrast it with short-term gains or "burning oneself out"--long-term loss.

B. Mile run.
   1. Proper warmup.
   2. Run 4 laps (110 yards each).
   3. 5-minute rest.
   4. Discussion.

      Note: Include short-term gain vs. long-term loss (as compared to the environment).

C. Watch Olympics and study their ability to:
   1. Pace themselves.
   2. Proper usage of body mechanics.

Outside or Community:

A. Have the head track coach speak on long-distance running.

B. Have someone from the track club talk on jogging and health.

C. "Over 40" jogging club member can speak to class.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Dynamic Physical Education for Elementary School Children, fourth edition, Victor P. Dauer	
Audio-Visual: TV programs (scheduled) on Olympics WAAU track and field programs.	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 10 - Economic Planning

SUBJECT Art

ORIENTATION Short/Long Term Factors

TOPIC/UNIT Multi-Media

BEHAVIORAL OBJECTIVES

Cognitive:

Construct a simple but quite long-lasting carrying vessel.

Affective:

Demonstrate awareness of the large number of things made hurriedly only to be thrown out just as hurriedly by collecting samples.

Defend the use of long-lasting, returnable containers in place of throw-away ones.

Skills Used:

1. Construction.
2. Pasting.
3. Gluing.
4. Sewing.
5. Cutting.
6. Sawing.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Make a water-carrying vessel. Students should choose their own way of making one and decide what materials are best. They must discover that some things might make for fast construction such as paper, but would not last as would leather.

Outside or Community:

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: The Art of Color and Design, second edition, McGraw-Hill, 1951 "Increased Awareness of Our Environment", map project, M.F. Wright, School Arts, p. 36-7, March '72 **Audio-Visual:** **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 11 - Individual Acts

SUBJECT Language Arts, Social Studies, Math, Art

ORIENTATION Individual Acts

TOPIC/UNIT Pollution

BEHAVIORAL OBJECTIVES

Cognitive:

Explain ways that individual and group actions affect the environment, within a class discussion.

Affective:

Criticize actions of themselves and others when they observe an ugly area in the environment.

Skills Used:

1. Writing narrative.
2. Oral reading for taping.
3. Cartoon drawing.
4. Observation.
5. Predicting.
6. Estimating.
7. Counting and computation.
8. Drawing conclusions.
9. Drama.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Language Arts
   - A. Discuss beautiful or attractive places students have seen. Discuss others that are ugly and unattractive. What caused the ugliness?
   - B. Students participate in groups of two or more to form graphic illustrations on how individual and group action affect the environment. Examples: Cartoons, dramatization, poems, etc.
   - C. For an extended study, use "Changing Attitudes By Studying Lifestyles by Reading Books". Available from ICE RMC.

II. Social Studies
   - A. Tour school grounds and neighborhood. Look for signs of injury to the local environment by continuing use by people.

(Continued)

Outside or Community:

I. Language Arts
   - A. Plan a photographic field trip. Take pictures (slides) of lovely natural scenes. Also take some pictures (slides) of places where man has polluted or marred the countryside. (Students may take notes to help recall the pictures they have taken).
   - B. After the pictures are developed and the choice one is selected, the students will write narration to accompany the slides. (Students may bring slides they have at home or may take pictures of pictures.) The narrative should be put on tape and the tape played as the slides are shown. To introduce the part of the

(Continued)

SUGGESTED RESOURCES

Publications:

A Place to Live, National Audubon Society, ICE RMC, 110 A
Our Precious Habitat, Melvin A. Benarde, W. W. Norton and Co., New York
Billboards and Signs, ICE field activity guide, available at ICE RMC

Audio-Visual:

Camera
Tape recorder
Time to Begin, film, DNR Film Library, Madison
Beer Can By The Highway, filmstrip, Warren Schloat Productions, Inc.
Our Environment 3 - Aesthetics, kit, EMC Corporation, ICE RMC, KT 31

Community:

Local photographer

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

1. Sidewalks.
2. Roads and streets (tire grooves).
3. Lawns.
4. Vandalism.
5. Playground - eroded areas.
6. Traffic areas.
7. Parks.

B. Discuss effect of one person's actions upon the environment. What happens when this is duplicated over a long time and by others over a period of time.

III. Math

A. Take a "litter walk" around the school playground. Give each group a large bag and designate areas to be covered. Give one child a separate bag and a large magnet to "sweep" the area and probe into sidewalk or asphalt cracks for metals.

B. Still outdoors, have the children empty the bags and sort the contents. Count the number of pieces of paper, bottles, string, etc. and record.

C. Re-collect the litter and dispose of it.

D. Class discussion and calculations.

1. How much of it was biodegradable?
2. Can they imagine the amounts of litter on all of the playgrounds in the community? In the state? In the country? In the world? Try to calculate these amounts.
3. Can some of the types of litter be called pollutants? What kinds?

OUTSIDE ACTIVITIES (Continued)

tape on lovely scenes, the song "America The Beautiful" could be sung. The song "Pollution" could be sung to introduce the part on the ugly scenes.

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	OUTSIDE ACTIVITIES (Continued) II. Social Studies A. Contact City Street Department or Department of Transportation for a person to speak on effects of use on streets. B. Contact City Engineering Department for resource person to speak on cost of cleaning public areas of graffiti. III. Math A. Have children collect the litter in their yards or on their blocks, estimate the incidents of certain types and prepare information to compare with those done for the school grounds. B. For a field study, use ICE field activity, Billboards and Signs. Available from ICE RMC.
Audio–Visual:	
Community:	

E. S. E. A. Title III – PROJECT I-C-E 59-70-0135-4

Environmental:

Integrated with:

CONCEPT NO. 11 - Individual Acts

SUBJECT Art

ORIENTATION Individual Alterations

TOPIC/UNIT Group Design

BEHAVIORAL OBJECTIVES

Cognitive:
Organize individual pieces to make a complete project.

Affective:
Accepts his responsibility of individual work in an effort to develop the whole.

Skills Used:
1. Batik.
2. Silk screen.
3. Block printing.
4. Tie dye.
5. Textile printing.
6. Group planning and cooperation.

STUDENT-CENTERED LEARNING ACTIVITIES

In Class:

A. Make composite garment for teacher. Each student designs his own individual piece of cloth. Techniques may be varied--batik, silk screen, tie dye, block printing, textile inks. Teacher sews together as a smock to be worn in class.

B. The project above could be used to make a wall hanging, a room divider, curtains, etc.

Outside or Community:

A. Have students collect paper from home and community. Plan field trip to a paper company. Have the paper recycled for use as drawing paper in the classroom.

B. Visit fabric shop to see various kinds of fabrics and patterns.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

A Dictionary of Art Terms and Techniques, Ralph Mayer, Thomas Y. Crowel Co., New York

"Batik As A Painting Technique", A. G. Webb, School Arts, 68:6-8 May '69

Art In The Primary Schools, Melzi, Oxford - Basil Blackwell, 1967

Audio-Visual:

Films:

Rag Tapestry, International Film Foundation

The Fence

Community:

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 12 - Stewardship

SUBJECT Language Arts, Art

ORIENTATION Ecosystem

TOPIC/UNIT Letter Writing and Summarizing

BEHAVIORAL OBJECTIVES

Cognitive:

Demonstrate his findings obtained from observation and using the critical analysis method and conclusions about man's stewardship of the environment.

Construct a bulletin board which illustrates the idea of man's steward of the environment.

Affective:

Suggest ways to help guard against any manipulation or man-made changes being committed against elements of the ecosystem.

Skills Used:

1. Writing concise letters.
2. Summarizing.
3. Researching.
4. Interviewing.
5. Constructing bulletin board.
6. Critical writing.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

I. Language Arts
   - A. Write various agencies of the federal, state and local governments to gain information about pollution in various areas, or how man has destroyed the balance of the ecosystem.
   - B. Bring papers and magazines and books with articles on how rights have been violated.
   - C. Have City Planner, Water Sewage Director or City Sanitary worker visit the class and explain pollution problems within the city.
   - D. Ask country forester agent or conservationist to visit class and explain pollution problem in a rural community.
   - E. When material from government agencies

(Continued)

Outside or Community:

A. Class visit to an industry or industries in your area.
   Suggestions:
   1. Paper company.
   2. Wisconsin Power & Electric Company.
   3. Nuclear Power Plant.
      a. Two Creeks.
      b. Kewaunee.
   4. Saw mill.

B. Discuss questions following visit.
   Examples:
   1. How does this industry affect you?
   2. How does this industry affect the people living near it?
   3. Students should discuss and learn more about industry and the effects in their community from parents and other adults.
   4. What would be the effects on the following points:
      a. Fishing.
      b. Scenery.

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

State Historical Society books and pamphlets
U. S. Office of Education, Environmental Problems Agency, bulletins, excerpts, free educational materials
Newspaper articles
Time magazine
U. S. News and World Report

Audio-Visual:

Student-made slides, 8mm films of local conditions

Community:

Politician
DNR representative
Water Department representative
Conservationist
Local contractor
Farmer
Local industries

CLASSROOM (Continued)

is received, have students compile and summarize important points made by the agencies.

1. Several students could write these on a master and run off copies for all students.

F. As a follow-up to these activities, students could write letters to various government officials with their suggestions, and also ask them what they could do to help guard against any manipulation or man-made changes being committed against the various elements of the ecosystem.

G. Try to make the students aware through discussion that they, as individuals, can play an important role in protecting the rights of everyone by protecting all elements in the ecosystem.

II. Art

A. Develop a bulletin board on comparison of city and rural community pollution problems.

OUTSIDE ACTIVITIES (Continued)

c. Aquatic vegetation.
d. Debate pro & con of industry or industries.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 12 - Stewardship

SUBJECT Science, Mathematics

ORIENTATION Noise Pollution

TOPIC/UNIT Hearing

BEHAVIORAL OBJECTIVES

Cognitive:
Explain the relationship between the level of noise and man's ability to work and to concentrate.

Affective:
Demonstrate an awareness of the effects of noise in the environment on man by citing examples from his community.

Skills Used:

1. Experimentation.
2. Describing.
3. Drawing conclusions.
4. Graphing.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Introduce by describing various environmental abuses in their community. Center on noise pollution.

B. Investigations to determine if listening to a loud sound could produce a temporary loss of hearing. (3-day experiment)
   1. Materials needed.
      a. Radio.
      b. Watch.
   2. Activity.
      a. Place your ear close to the radio and adjust to volume to as loud as you can tolerate without the sound becoming painful.
      b. At the end of 15 minutes, turn the radio off and try to hear your watch.
      Note: Have someone record the amount of time that passes

(Continued)

Outside or Community:

A. Get a tape recorder and record sounds in various locations such as a library, supermarket, school room and grounds, street, and, if possible, factory and airport. Be sure that you use the same power to record in each place. Ask someone to narrate on the tape by announcing the location.

B. Try this experiment at home and report to the class:
   1. Take a watch, a radio and a yardstick into a quiet room. Put the watch on the table and measure the distance you can go before you can stop hearing the watch.
   2. Turn on the radio to a rock station as loud as it will go. Listen for five minutes. Turn it

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

Science: Generating Ideas, Jacobsen, Victor, Bullet, Del Giorno, Konocek, Vessel, Wong, American Book Co., p. 177-220

Pollution: Examining Your Environment, Mine Publications, ICE RMC, 120 Ma

Audio-Visual:

Film:
Death Be Not Loud, McGraw-Hill, Film #490

Kit:
Our Environment 2 - Sound and Noise, EMC Corporation, ICE RMC, KT 30

Community:

CLASSROOM (Continued)

before you can hear the ticking of the watch.

c. Repeat the experiment the next day listening to the radio for only 10 minutes.

d. Repeat the experiment again on the third day for five minutes.

3. Observations and recording.
   a. Make a chart and record your observation.
   b. Graph time needed to hear the watch vs. listening time.
4. Conclusions and discussion.
   a. What length of listening time produced the longest time for which the watch could not be heard?
   b. Predict how long you would not be able to hear the watch if you listened for 20 minutes, 30 minutes and one hour.
   c. What do you think would be the result of listening to the loud noise for a month or more?

C. Investigations with tape recorder.
1. Bring in results of Outside Activity A. Listen to the recordings in class. Which places have the loudest sounds? Which places make the most noise for the longest time? Which places make the most unpleasant sounds? What conditions make one place quiet and another noisy?

D. Other investigations on noise.
1. Recognizing voices.
   a. Have two students sit where they can't be seen by the rest of the class. Give them several books containing stories with which all the children are familiar.
   b. Each volunteer selects a different book and begins reading. Both students begin to read at once at a normal tone. Rest of the students must guess which student is reading which story. A correct guesser replaces the reader.

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	CLASSROOM (Continued) c. Increase the number of readers to three, then four, etc. See how long the guesses remain correct. 2. How noise affects your heartbeat. a. Have students, on signal, count their heartbeat for one minute in a quiet room. b. Have three or four students go to the back of the room where they won't distract others. There they will make noise such as repeatedly dropping books and pencils, tapping with a ruler on metal, snapping fingers or other random loud noises. The rest of the class will again check their heart rate for one minute and write it down.
Audio–Visual:	c. Compare the results. (Scientists say that the rate for most people with either increase or decrease. Very few will remain the same. Noise has a definite effect on pulse rate.) 3. Effect of noise on mental work. a. Distribute a short set of questions or arithmetic examples to be done in a given period of time in a quiet atmosphere. b. Repeat the procedure in a noisy atmosphere with a second set of questions or examples. c. Check each set and compare the results. E. Filmstrip and related activities in Our Environment 2 - Sound and Noise.
Community:	OUTSIDE ACTIVITIES (Continued) off and then immediately test your ability to hear the watch at the same distance. If it can not be heard, how much closer must the student get to hear it? C. Invite someone from a factory to discuss the noise level there, and what is being done to correct it if it is high.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 12 - Stewardship

SUBJECT Mathematics

ORIENTATION Snowmobiles

TOPIC/UNIT Multiplication

BEHAVIORAL OBJECTIVES

Cognitive:

Predict several consequences of uncontrolled development of "open spaces" and snowmobile trails.

Affective:

Suggest ways of controlling the development of land used for snowmobiling in an effort to reduce environmental destruction.

Skills Used:

1. Large-number multiplication.
2. Interviewing.
3. Drawing conclusions.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. See following sheet and formulate problems for class to work. Examples:
   1. What is the minimum number of snowmobiles registered June, 1971?
   2. What is the maximum number of snowmobiles registered June, 1971?

B. The average amount spent for snowmobiles in 1970 was $1,000.
   1. What was the total amount of money spent for the minimal number of snowmobiles registered?
   2. What was the total amount spent on the maximum number of snowmobiles registered?

C. By 1980, $156,337,370 will be needed to buy and develop land for snowmobiles in Wisconsin. This would make 421,000 acres for open

(Continued)

Outside or Community:

A. Have the students write to International Snowmobile Industry Association News Release, 5100 Edina Industrial Blvd., Minneapolis, MN 55435, c/o Public Relations Department for the number of snowmobiles registered in the U.S. and the total amount of land available for trails and open spaces.

B. Calculate the number of snowmobiles in their community.

C. Have students go out in pairs and make a neighborhood survey. Example questions:
   1. What is good about snowmobiling?
   2. Do you think snowmobiles are or could be a problem?
   3. If they are not now, how about the future? What kind?

(Continued)

SUGGESTED RESOURCES

Publications:

A Program For Snowmobiling in Wisconsin, DNR, Bureau of Commercial Recreation, Box 405, Madison, WI 53701

National Wildlife magazine, National Wildlife Federation, 534 N. Broadway, Milwaukee, WI 53202, Dec.-Jan., 1972 or ICE RMC

Audio-Visual:

Community:

DNR representative
Local farmers
Snowmobile club
County Land Office (Registrar of Deeds)

CONTINUED OR ADDED LEARNING ACTIVITIES

CLASSROOM (Continued)

spaces plus many miles of trails available for snowmobiling. In order to meet the required needs by 1980, 10,000 more miles of trails must be added costing $38,000,000 and 127,000 acres of open space must be added costing $120,000,000.

1. What is the average amount per mile for additional trails?
2. What is the average amount per acre for additional open space?

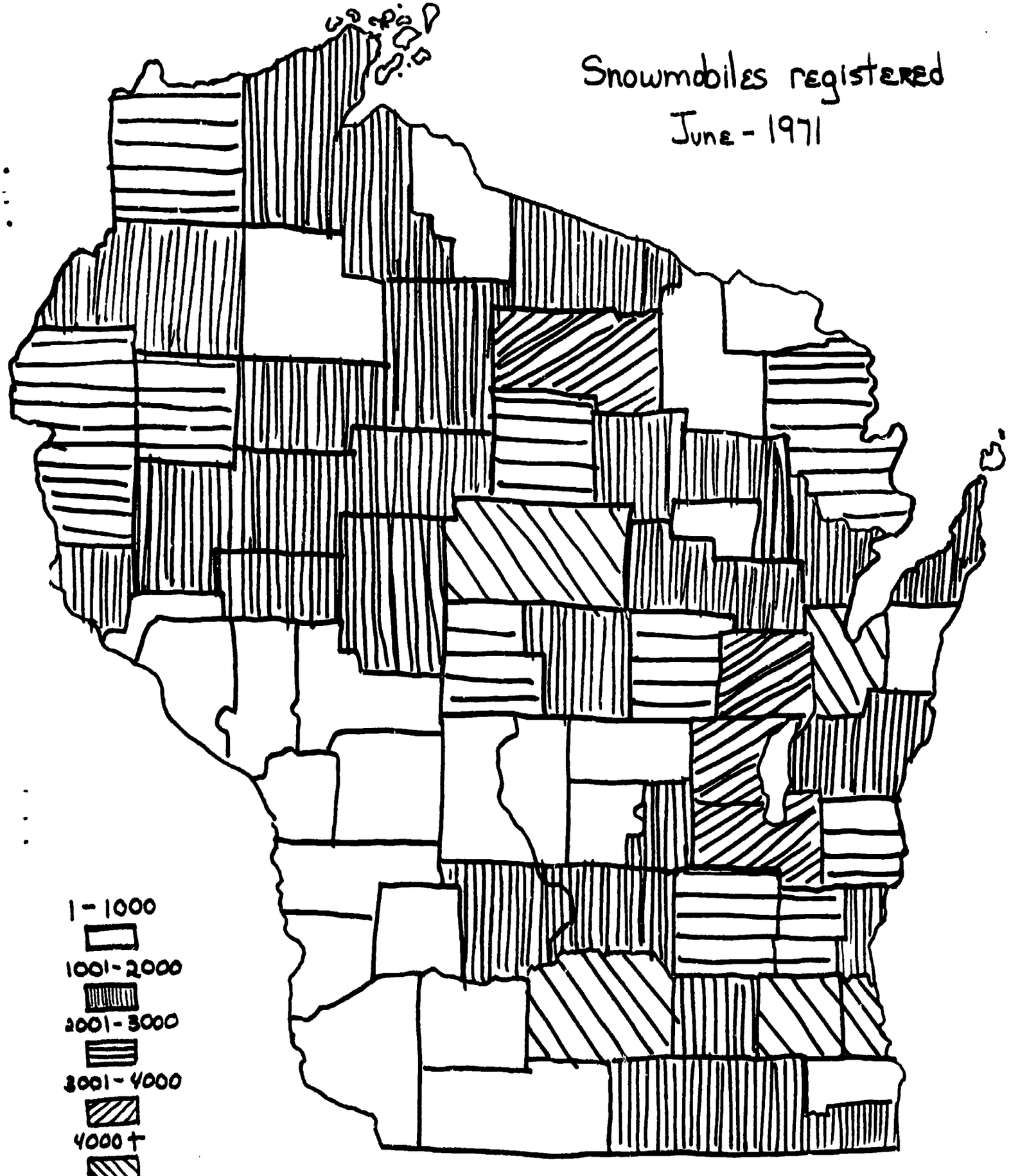
OUTSIDE ACTIVITIES (Continued)

4. What kind of restrictions should be placed on snowmobiles? If any, why?

D. Report findings in class.

E. Correlate with social studies to discuss the advantages of recreation.

Snowmobiles registered June - 1971



E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 12 - Stewardship

SUBJECT Art

ORIENTATION Stewardship Rights

TOPIC/UNIT Ceramics

BEHAVIORAL OBJECTIVES

Cognitive:

Identify those creatures which are in danger of becoming extinct.

Identify groups or individuals who are over-extending their use of our resources and explain the probable reason(s) for this amount of use.

(Continued)

Affective:

Feel disgusted with those who have over-used things that were not theirs to abuse.

Skills Used:

1. How to form clay objects.
2. Texture.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Clay work.
   1. Children could model images of animals that are becoming extinct, e.g. bald eagle, Bengal tiger, mountain lions, seals, penguins, kangaroos, etc.
   2. These images must be quite realistic--they can be plaques or 3-dimensional objects.
   3. Clay figures could be bisque fired, glazed and glaze fired, or made of plastacine (green-gray non-healing clay).

Outside or Community:

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: "Clay Is Fun", R. A Yader, School Arts, p. 20-21, Oct. '71 "Clay & Young Hands Go Together", G. Krause, Arts & Activities, p. 8-12, Dec. '67	COGNITIVE (Continued) Construct a ceramic figure that represents the likeness of one of the animals in danger of extinction.
Audio—Visual:	
Community:	

APPENDIX

Can Be Used With Concepts 2 and 3.

CROWS AND CRANES

Equal number of players in two straight lines, three feet apart. One team is "Crows", the other team is "Cranes". When teacher calls "Crows", they run to their goal line and cranes try to tap them. If he calls "Cranes", cranes run to their goal. Any player caught goes to opposite team.

Can Be Used With Concepts 6 and 10.

GERMAN BATBALL

Equipment - 2 plastic bats, 1 soft 8" playground ball.

Ball and bats are placed in center of playing area. Teams are lined up on each goal line. Each player on each team is given a number. When a number is called, the two players run to center and try to hit the ball over opponent's goal line. Team members cannot guard the goal. Point is scored when ball crosses goal line.

Can Be Used With Concept 7.

LONG BASE

Equipment - one playground ball, ball diamond; second base is only base used.

One team is up; the other team is spaced on the playing field. Ball is thrown into the field. Runner attempts to run around base and home before being hit by the ball. Once a fielder has the ball, he cannot move but must either hit the runner or pass the ball to another player. There are three outs to each inning.

Can Be Used With Concepts 7 and 9.

INDIVIDUAL KICKBALL

Two equal teams. Team one is up to make points, while team two players are in the field. Player kicks ball out into field and attempts to run as many bases as he can before his opponent can bring the ball to home base. One point is scored for each base. A home run scores five points.